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Structural Segregation in Gray Iron

Normal Occurrence and Practical Significance of Non-homogeneous Structures—Relation to Composition and Physical Properties

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THIS paper points out some of the normal structural segregations occurring in gray irons and semi-steels, and indicates the practical significance of their non-homogeneous structures.

The segregations especially considered are those of graphitic carbon flakes. While the amount and size of these flakes are well known to affect the properties of the metal, their exact distribution (and its significance) have received little attention. Some consideration is given the normal variations of pearlite and ferrite. Effects of phosphorus distribution are explained. Effects of abnormalities in composition, etc., are not considered.

Structure Varies: It is common experience that the general structure varies with the depth of section; that is, with the cooling rate. Fracture shows that structure, particularly in heavy sections, often varies quite markedly from the outside of the casting to the center. In sections of moderate size, say up to 2 in., fractures of better grade irons show little variation from the outside to the center. On very small sections (like piston rings) we sometimes find that pesky discontinuity in structure, the hard or chilled spot. Such structural differences can be seen in the fracture without magnification. However, if we take a bar of apparently uniform fracture and examine it at rather low magnification we are likely to find a structural segregation of great practical significance.¹ (The following paragraph on crystallization is inserted in order to make the subsequent data clearer to the general reader.)

Crystallization Dendritic: Pure metals and eutectics solidify at definite temperatures. Alloys, like cast iron, (iron-carbon alloy), usually freeze over a range of temperature. In other words, they go through a pasty stage, some parts of the metal being solidified while the remainder is still liquid. Fig. 1 (iron-carbon

diagram) shows where this range is in ordinary cast irons. The first formed crystals have time for growth before complete solidification takes place. The effects of this initial crystallization (as will be shown later) often persist in spite of the subsequent changes met on complete cooling. The initial crystallization is dendritic, the crystals building up in the pine tree or fern-like structures.

Testing Methods Limited: It is only too true that analysis alone gives very little idea of the engineering properties of cast iron. This is because irons of identical analysis may have greatly different structural make-ups, and hence widely varying physical properties. Years ago the common practice was to grade iron by fracture. This practice was discarded by foundrymen because the fracture of the pig often had little resemblance to the fractures of irons melted from it. Fracture appearances are difficult to record or to express in any definite measurable terms. Notwithstanding these objections, study of fracture is a valuable method even today.

The great success of microscopic methods in revealing the actual structures of alloys (especially of steels) has lent encouragement to the application of microscopic methods to study of cast irons. The results obtained by various workers in the cast iron field prove the value of the method, and the last 10 years have shown active growth of its appreciation by practical men. Nevertheless, the writer wants to point out some of the definite limitations to practical application of microscopic methods to study of cast iron.

First, cast irons are not uniform in microstructure. If we photograph a section at say 200 dia. the photomicrograph may give an erroneous impression of the structure of the bar because *insufficient area* has been taken into consideration. At such a magnification the area examined is very small and it is impossible to pick a representative area for photography. This trouble is easily and satisfactorily overcome by examination at lower magnification, covering an area of $\frac{1}{4}$ in. dia.,

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¹ It may be said that steel, which after proper treatment (in moderate sections) is apparently quite homogeneous in crystal structure, has been shown to retain persistent dendritic segregation to a remarkable degree.

CAST iron is not homogeneous in structure, as it has numerous structural segregations, mostly dendritic. These segregations influence the physical properties of the metal. In this article, crystallization is reviewed; limitations of methods of analysis, microscopy and fracture are indicated and primary crystallization of cast iron is explained.

The distribution of graphite is dependent largely on the type of primary crystallization of the metal. Brief mention is made of arrangement of pearlite, ferrite and steadite. Research in the author's laboratory indicates that graphite flakes are the most important indicator of cast iron's physical properties. The relations among structural segregation, composition and physical properties are carefully detailed from results of tests on commercial irons.

or better. Figs. 2, 3 and 4 illustrate the point. Visual examination of the polished surface is often very instructive. Second, cast iron is a very complex material. Variables are so numerous that great caution must be used in drawing conclusions. Notwithstanding these objections, microscopy is one of the most valuable

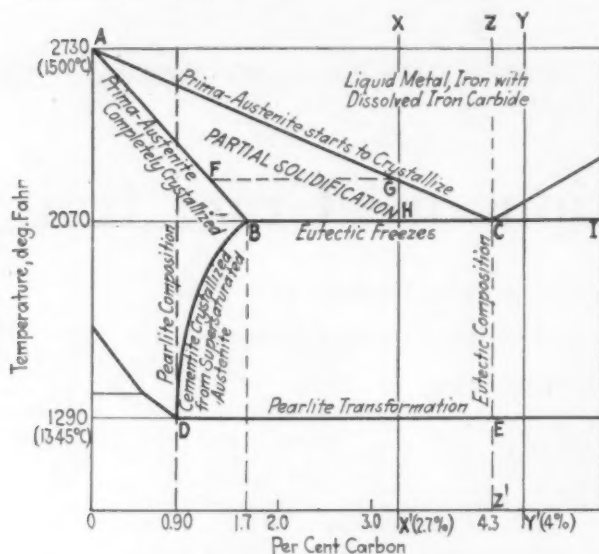


Fig. 1—Diagram for Pure Iron Carbon Alloys. The presence of impurities changes the location of the various points to some extent. Thus the percentage of carbon required for the eutectic (4.3 in pure alloys) is around 3.7 in commercial irons. The pearlitic transformation temperature is about 1345 deg. Fahr. in the semi-steels used here. The lines XX', Y Y' bound the carbon ranges of commercial cast irons (2.7—4.0). The large majority of irons contain 3 to 3.75 per cent carbon. It is evident that with lower carbon more prima austenite will separate (along the line FB for irons of X composition). Also, the longer time in the range GH, the larger the dendrites. The bulk of graphite must come from the eutectic ledeburite (Z Z'). Graphitization takes place from B C to D E (the author thinks that there may be some graphitization above B C and below D E).

tools we have—indeed, in research work it is indispensable.

Crystallization of White Iron: When molten, cast iron is a solution of cementite (iron-carbide) in iron. As explained above, commercial irons freeze over a range of temperature. In this range, primary crystals of aus-

tenite (prima austenite) separate as indicated in the diagram. With lower total carbon, more prima austenite is formed, and with slower cooling, through the range GH (Fig. 1), these prima austenite nuclei have a good chance to grow into larger dendrites. These dendrites, from their mode of formation, are progressively richer in carbon from their cores to their bounding surfaces.

When the temperature has reached about 2070 deg. Fahr. the remaining liquid freezes as the austenite-cementite eutectic, ledeburite (line BCI, Fig. 1). From 2070 to 1290 deg. Fahr. cementite separates from the supersaturated austenite (line DB, Fig. 1). At 1290 deg. Fahr. the remaining austenite (now about 0.90 per cent carbon) is transformed into pearlite.

On etching white iron with picric acid, the pearlite (following the original austenitic outlines) appears dark, the cementite white. The cementite, being the last to freeze, forms "female" dendrites between the original austenitic dendrites (See Fig. 5). Some of this cementite appears as structureless dendrites, while some occurs as the typical honeycomb eutectic (ledeburite). The initial graphitization occurs along the borders of these cementitic structures. In ordinary irons this graphitization continues until all the free cementite has graphitized. This original or primary graphitization, the writer feels, should be distinguished from the re-arranged graphite occurring as a result of grain growth. The writer suggests the names "primary" and "secondary" to indicate these different stages of graphitization.

Since the "primary" graphite follows the cementite areas, it is found in various striations and other types of segregation, in irons in which cooling was swift enough to prevent much secondary graphitization. Typical examples of such segregations are shown in Figs. 6, 7 and 8, 9 and 10.

Dendritic segregations (such as those shown in Fig. 6) can be seen by the unaided eye on a carefully polished surface of cast iron. Such irons may be said to possess a somewhat acicular macrostructure (Fig. 11).¹ Most strong irons possess marked indications of such a structure, indicating that cooling and composition have been so adjusted that the graphite is in the more finely divided primary form and that the metal is rather low in total carbon.²

Influence of Ferrite and Pearlite: Generally speaking, ferrite merely follows the graphite. The more graphite the more ferrite. Ferrite first forms along the graphite flakes, as shown in Fig. 12. Of course ferrite, in replacing the stronger pearlite, weakens the metal. At the same time, the graphite is increased

¹ Acicular means interlacing needle-like structure. Macrostructure means structure apparent, either without magnification or visible on low magnification.

² Prima-austenite indicating carbon content less than the eutectic.

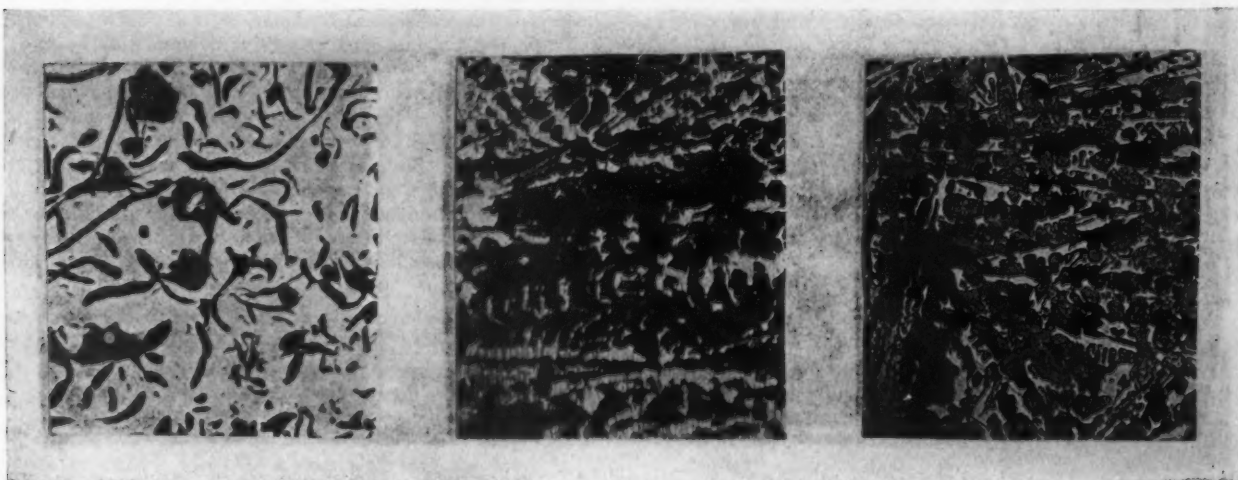


Fig. 2—The Structure of the Iron Is Not Always Uniform. For example, one part of this micrograph shows coarse graphite, the other fine. High power microscopy could show only one part. Which is representative, the coarse or the fine? Macroscopic methods overcome such objections. (100 dia. unetched.) Fig. 3—Structure of white iron. The white is free cementite, the dark pearlite (formerly austenite). 100 dia., etched with picric acid. Fig. 4—Graphitization just started along cementite dendrites. (Graphite black, cementite white, pearlite gray.) 75 dia., etched and slightly repolished

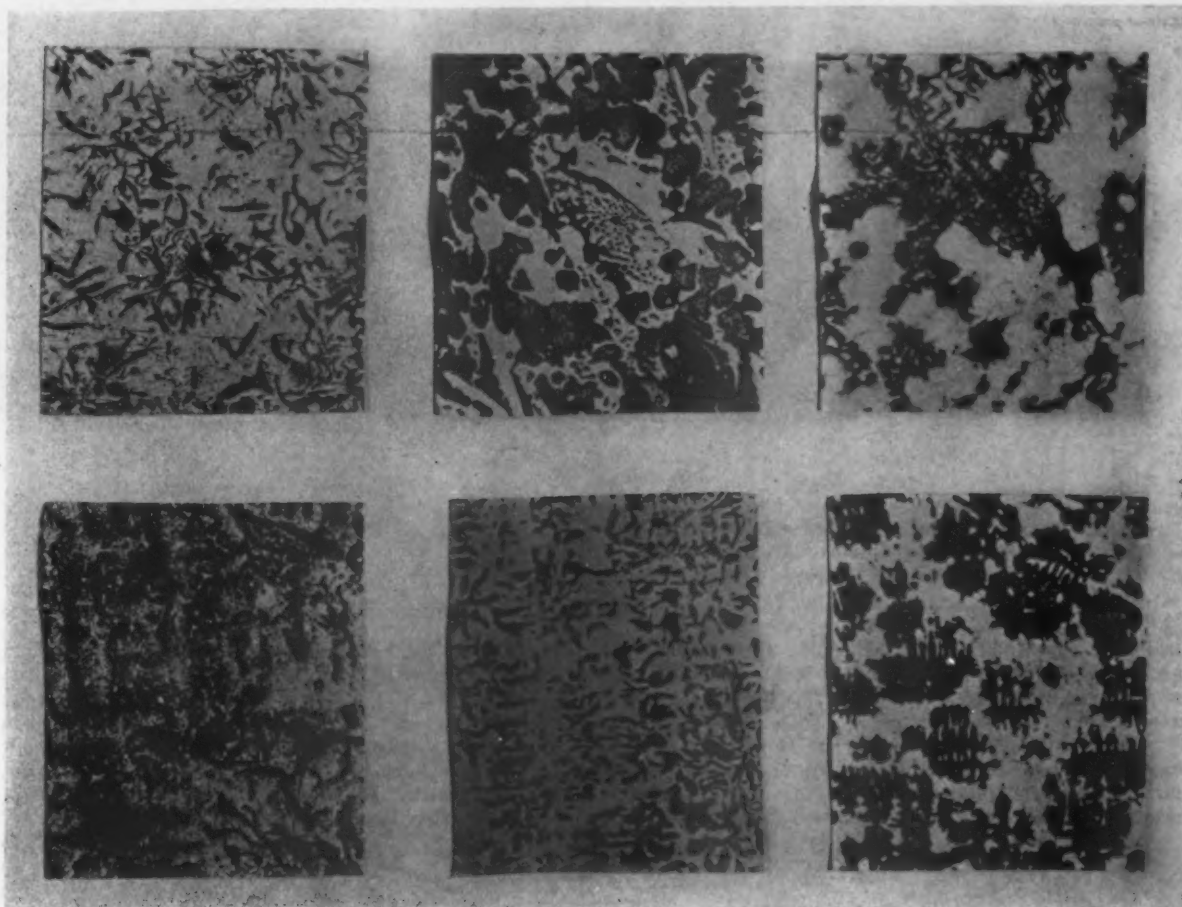


Fig. 5—Graphitization of Cementite Completed. 75 dia., unetched. Fig. 6—White iron, showing the honeycomb eutectic ledeburite. 75 dia. picric acid. Fig. 7—Gray iron, graphite groupings, resembling outlines of ledeburite groups. (On slower cooling the author finds that this type graphite group seems to arrange itself into whorls, as Fig. 8). 75 dia. unetched. Fig. 8—Showing intermediate stage of graphitization along female dendrites of cementite. Magnification 100 dia., slight etching. Fig. 9—Long dendrite form, showing extent of growth of this size of segregation in ordinary test bar. 75 dia. unetched. Fig. 10—Unique graphite formation found in quickly cooled piece of iron. Unetched, 125 dia.

both in amount and size, accelerating the lowering in strength. Ferritic metal is hard to finish, as it tears up badly under the tool. It is weak and open grain.⁴

Pearlitic Irons: Pearlitic, or eutectoid iron, contains about 0.80 per cent combined carbon. With over 0.60 to 0.70 per cent combined carbon most irons appear almost wholly pearlitic. (Fig. 13.) The laminar structure of pearlite is shown in Fig. 14. All high-test irons are pearlitic, but the converse is not true. Pearl-

⁴ Annealed irons are not considered.



Fig. 11—Acicular Macrostructure (See Fig. 2)

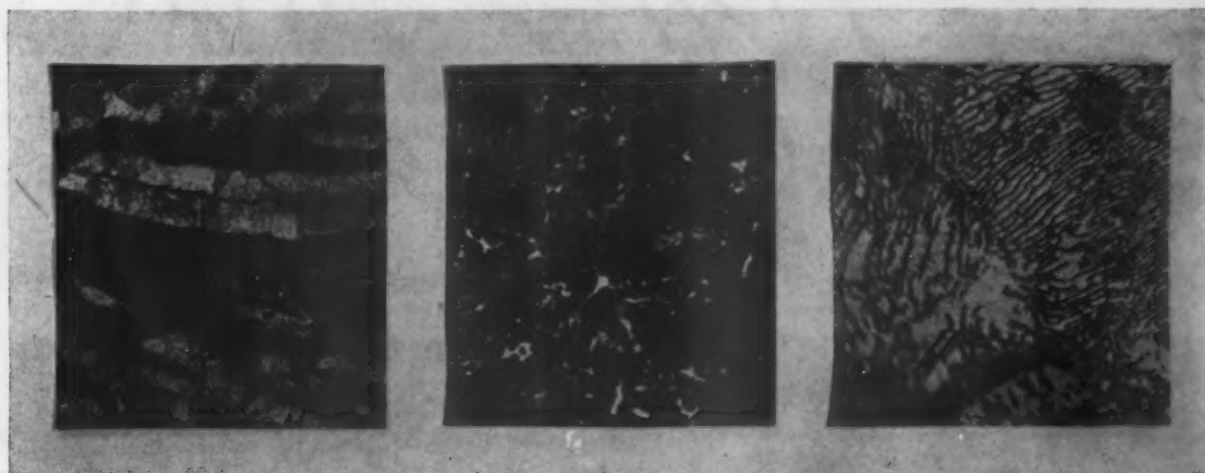


Fig. 12—Ferrite Bands Along Graphite Flakes. Broad, almost white bands are ferrite, in center of which graphite flakes appear gray. Pearlite shows some of thumbprint structure. A weak, open iron. 100 dia., picric acid. Fig. 13—General pearlitic structure of low-phosphorus iron. Approximate eutectoid matrix, combined carbon about 0.70 per cent. 100 dia., picric acid. Fig. 14—Structure of pearlite. 585 dia., picric acid

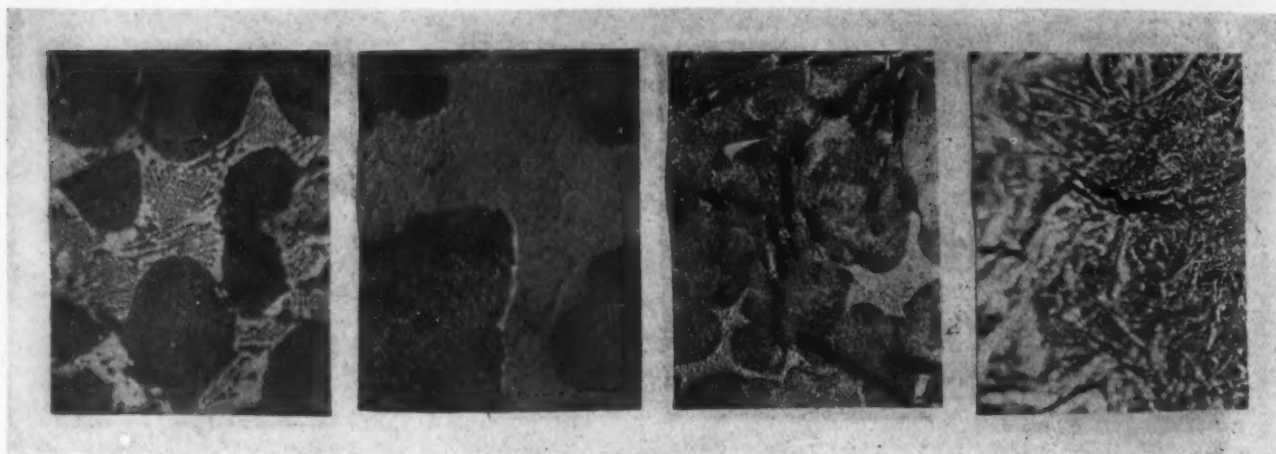


Fig. 15—Steadite in High Phosphorus Iron. This dendrite shows a typical eutectic structure. (Phosphorus 1.15 per cent. 610 dia., picric acid.) Fig. 16—Steadite in low phosphorus iron. This is not an eutectic structure and probably contains much less than 10 per cent phosphorus. (0.17 phosphorus, 600 dia. picric acid.) Fig. 18—Phosphorus forms coalesce on slow cooling. 50 dia., picric acid. Fig. 19—Examination of this picture shows how the fracture follows along the flakes of graphite, the weak points. Low magnification

itic iron contains pearlite, graphite and steadite. If such iron has little steadite and a small amount of primary graphite very uniformly distributed, it will be very strong.

Various processes (such as the German "pearlitic" cast iron) are designed to so regulate the cooling through the critical ranges that the above conditions are met. The writer has obtained many interesting

throughout the heavy sections? The bad effects of this can be minimized, but that is another story.

Structure of Pearlite: Pearlite occurs in a laminar formation as shown in Fig. 14. The laminations may be fine, or they may be coarser, depending on the rate of cooling. Very rapid cooling produces an almost sorbitic structure. By means of heat treatment, martenitic and other transition forms can be produced, exact-

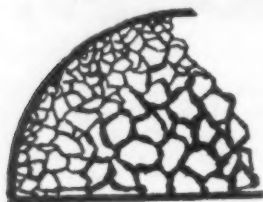


Fig. 17—Network Macrostructure. Phosphorus structures often make up this method



Fig. 20—Macrostructure of Whorl Formation

results on small sized pieces. When one thinks of such processes applied to castings of 25,000 to 100,000 lb., he strikes some snags.

First, how handle the casting in cooling? Second, (and here is the real snag!) how get uniform cooling

ly as is the case with steel. The condition of pearlite is hardly a major factor in the structure of commercial cast irons. It indicates the cooling rate, but one can tell more by examination of the graphitic structure.

Effects of Phosphorus: Phosphorus formations do

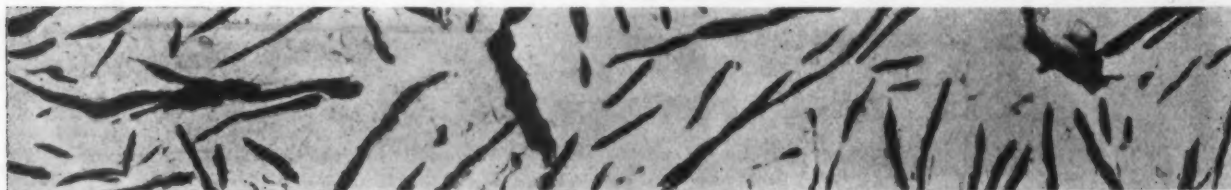


Fig. 21—Coarse Graphite Structure of Weak Iron. 50. dia. unetched

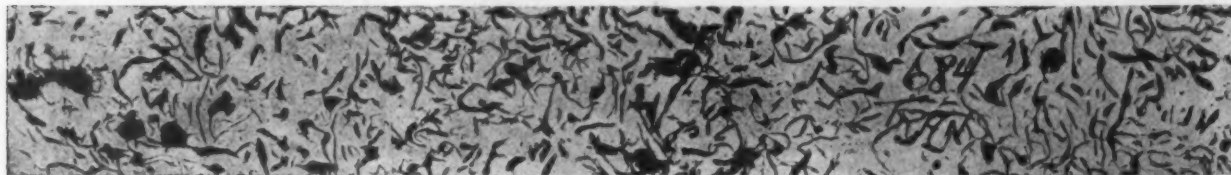


Fig. 22—Medium Graphite, Fairly Large Whorls, Moderate Strength. 50 dia. unetched

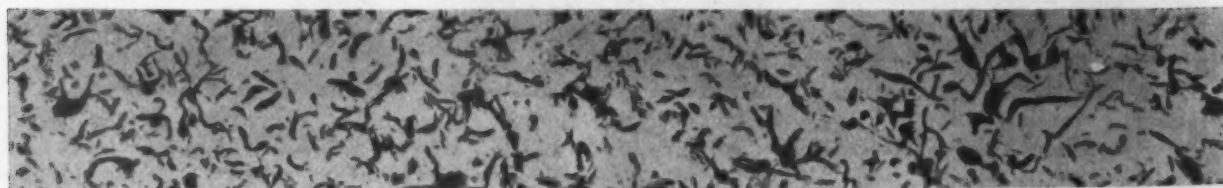


Fig. 23—Small, Very Evenly Distributed Graphite, Indicating a High Test Iron. 50 dia. unetched

not seem to have any very marked influence on the strength of ordinary irons. The phosphorus rich parts (steadite, Figs. 15 and 16) are the last to freeze. Hence, they are found between the crystals of the other structures. If the sections are small and the phosphorus fairly high, the steadite is often found around the pearlite grains, giving a structure like that seen in Fig. 17. If the cooling is slow and the phosphorus fairly high, the steadite coalesces, as shown in Fig. 18. If the cooling is very slow (and the metal almost all ferritic) the steadite dendrites seem to be largely absorbed by the ferrite. Some writers claim that phosphorus network is essential to high strength. This is not necessarily true. Some low phosphorus irons of very high strength show no network.

Rather rapid cooling, which is productive of high strength, also makes network structure in higher phosphorus irons. Steadite, meaning the phosphorus-rich formation in cast iron, is not necessarily eutectic. (See Figs. 15 and 16). The main practical effect of phosphorus seems to be that of a hardener, reducing the tool life, and hence the machinability of high test irons.³

Structure of Weak Iron: Low strength iron possesses a characteristic dark open fracture. The graphite flakes are large. Fractures follow along these flakes, as shown in Fig. 19. Careful visual examination of the polished surface of such an iron often shows characteristic "whorl" formations, as illustrated in Fig. 20. Occasionally there is some evidence of large dendritic growth, but the graphite has usually rearranged itself (due to growth) so that the semblance is lost. The

³ Pearlite is last to decompose along steadite dendrite.

macrostructures of low strength iron often resemble (to the writer's imagination) the frost structures seen on window glass. There is marked local segregation of graphite, and high magnification would show some areas heavy in graphite while others would be practically free of flakes. A glance at Fig. 21 shows how essential it is to consider the structure as a whole. The etched sample of such an iron would show a large amount of ferrite along the graphite flakes. The steadite dendrites are large and there is little evidence of network formations.

Structure of Medium Irons: Medium strength irons show a fairly good fracture. They often possess a network macrostructure. (Fig. 17.) This network is smaller in the higher test irons. Graphitization is rather uneven in such irons. (Fig. 22.) Usually there is quite a bit of whorl formations resulting from graphitization and partial growth of eutectic cementite, i.e., such strength irons in small sections usually have pretty high carbon. The matrix may be nearly eutectoid.

Structure of High-Test Irons: The majority of high-test irons are low in total carbon and silicon. Their greatest strength is in the moderate sections ($\frac{1}{2}$ to $1\frac{1}{2}$ in.). Fracture is light gray and very fine.

Macrostructure usually has considerable dendritic formations around the edge (Figs. 9 and 11) with fine network toward the center. The microstructure shows small graphite throughout, with some dendritic formations. Some exceptionally high-test irons showed remarkably uniform distribution of graphite. (Fig. 23.) All high-test irons are eutectoid, or "pearlitic" irons.

Discussion on Employee Representation

Some Facts and Factors Which Measure Its Success—Examples
Taken from Periods of Strife—"50-50" Essential

BY ARTHUR H. YOUNG*

SOME day when somebody writes a real history of employee representation it probably will be made to appear that the starting point of this development in the United States, as far as the time element is concerned, was about the year 1915. This genesis, this starting point, of employee representation seems to me to have been brought about and established by the coincident realization on the employer side of the barrier of two fundamental ideas. The first of these has been clearly stated by John D. Rockefeller, Jr., in the following words:

Most of the misunderstanding between men is due to a lack of knowledge of each other. When men get together and talk over their differences candidly, much of the ground for dispute vanishes. In the days when industry was on a small scale, the employer came into direct contact with his employees, and the personal sympathy and understanding which grew out of that contact made the rough places smooth.

However, the use of steam and electricity, resulting in the development of large-scale industry with its attendant economies and benefits, has of necessity erected barriers to personal contact between employers and men, thus making it more difficult for them to understand each other.

In spite of the modern development of big business, human nature has remained the same, with all its cravings, and all its tendencies toward sympathy when it has knowledge and toward prejudice when it does not understand. The fact is that the growth of the organization of industry has proceeded faster than the adjustment of the interrelations of men engaged in industry.

The second of these fundamental ideas could hardly be stated in better terms than those which were thoughtfully agreed upon and formally published by

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the authorized representatives of the great body of employing power and employing sentiment in America, to wit:

The human element in industry is the factor of greatest importance. Capital cannot exist without labor and labor without capital is helpless. The development of each is dependent upon the co-operation of the other. Confidence and good will are the foundation of every successful enterprise, and these can be created only by securing a point of contact between employer and employee. They must seek to understand each other's problems, respect each other's opinions, and maintain that unity of purpose and effort upon which the very existence of the community which they constitute and the whole future of democratic civilization depend.

Reducing and refining each of these two statements to its essentials and then putting them together, we can easily see a resultant situation out of which an important development was bound to come. That moment in which any considerable employer of labor came clearly and frankly to the conclusion that "the growth of the organization of industry has proceeded faster than the adjustment of the interrelations of men engaged in industry" and to a realization of the complementary truth that "the human element in industry is the factor of greatest importance," marked the conception if not the birth of this development that we call Employee Representation. After that it was inevitable that industry should begin to find a way and a means of orderly progress to such a peace and happiness as industry had never known.

In fine, the coming of employee representation was the unquestionably logical and apparently effective answer to the need and the demand for an interrelationship that would keep pace with the growth of industry, and for a means and a medium of contact and cooperation between industrial management and industry's most important factor—the human element.

While 1915 marked the first practical experiment

with the employee representation idea, it was several years later before this new development began to receive anything like general public attention. When the future historian of this movement undertakes his task I rather think he will settle upon 1919 as the beginning of the employee representation period. Before then, and as early as 1915, it is true, the subject had been dealt with from a theoretical standpoint by some of our advanced thinkers on economic and industrial questions; it is also true that a number of courageous employers with progressive ideas and tendencies had experimented with it in one form or another, and had even undertaken practical demonstrations of the idea in their own establishments.

But you will recall that five years ago there were not more than a dozen factories or other industrial operations working under any kind of employee representation. Even the most fortunate of these pioneers had not then achieved any conspicuous success—the new idea was very largely in the laboratory stage.

All of you can recall the industrial relations picture of 1919—chiefly a picture of industrial warfare; not merely one darned strike after another, but one coincident with another. That year brought us not only hundreds of localized strikes, disturbing the peace of practically every important industrial center, but also two of the worst and greatest general strikes in our industrial history—the steel strike and the coal strike in the latter part of 1919.

Need for Cooperation Made Manifest

Surely that distressful year, above all other years of our experience, brought sharply and strongly home to use the need for something new in our industrial relations—something that would build a ladder over the old, strong, high barrier between capital and labor or drive a tunnel through its foundations. Then, as never before, men on both sides of the barrier felt a pressing need for some plan or some system that would function for the gigantic organization of modern industry, as the old-time personal contacts had functioned for the old-time industry of little shops and small-scale production.

In 1919 there were, as I have said, not more than a dozen employee representation plans in operation. Today more than a thousand companies or firms, big and little, are working and living according to this principle in one form or another. I shall not attempt to state that progress in terms of employees affected, but it is safe to say that where the employees working under this system were numbered then by thousands, they are numbered now by tens or even hundreds of thousands.

Scanty as they may be, these figures tell a story of marvelous progress. It is all the more marvelous when you reflect that it has been accomplished without propaganda, without organized effort of any kind, simply by the force of example and out of the desire as well as the need for a betterment of the industrial relation. In other words, the development of employee representation has been as unforced, as natural and as spontaneous as its genesis.

Experience of the Harvester Company

Employee representation was put in effect in 17 of the International Harvester Co. manufacturing establishments, wherein the majority of employees voted affirmatively to come under the plan, on March 12, 1919. The employees at three of the plants (all located in the middle west side of Chicago) rejected the plan. Two of these three plants almost immediately reballoted, at the employees' request, and came under the operation of the plan by a tremendous majority vote. The third plant delayed its acceptance of the plan for about two years, and when finally a rebalot was had at the request of the employees themselves, its acceptance occurred by the tremendous ratio of ten to one in favor of the plan.

In July, 1919, there occurred a walkout of employees in the one Chicago plant then not within the operation of the plan, a walkout wholly unexpected except that instances of that kind were then very much the order of the day in the Chicago district. At this period we

were in the midst of the great packers' strike, the Corn Products and Crane employees were at warfare with their employers, and there was a further seething torrent of racial strife, eventually resulting in placing portions of the city under martial law. The walkout was directed principally by leadership entirely alien to American ideals and was confined almost wholly to foreign-born employees.

It was preceded by no demands or opportunity for the consideration of grievances; in fact, it was not until 13 days after the initial walkout that any committee of the strikers made any effort to communicate with company officials. A concerted effort was made to enlist the employees of the company's neighboring plants in the walkout and it was this crisis which the works council plan was so quickly called upon to meet.

Action of the Works Council

As soon as the news of the disturbance at the one plant reached the officers of the company the works councils of the other Chicago plants were called into session and all of the information at hand was made available to them. The councils were then asked to recess in order that the representatives might discuss the matter thoroughly with their constituent employees, and to meet again later in the day for discussion of whatever grievances might be found to exist and to deal with the situation at the struck plant as it might affect the operation of their works. In the meantime, strenuous efforts were being made to picket the plants and pull out the employees, not so much by the striking employees of the Harvester plant as by the hoodlum element which quickly attached itself to a disturbance of that kind in Chicago at that time.

It quickly became apparent, by direct statement of the employee representatives, that no major grievances existed between the company and its men and that the rank and file of employees were determined to continue in their regular occupation, under the conditions wholly acceptable to them, insisting upon the preservation of this natural right of American citizenship. It also quickly became apparent that to pursue this course would mean something little short of civil war, as the hoodlum element was determined that the plants should cease operation. The police force was concentrated in another portion of the city because of race riots occurring there and the forces of law and order were for the moment unavailable.

Safety of Personnel Demanded Closure

Then followed a debate as to whether the plants should be shut down as a matter of personal and public safety or should continue to operate, with all the horror of strife thereby entailed. Gradually cooler counsel prevailed and we ultimately had the spectacle of the employees and management of several of the plants of a great industry, located in the second city of the nation, agreeing that it was not then possible for workmen to continue in the orderly discharge of their wholly acceptable duties, because of the prevalence of disorder and anarchy.

It was mutually agreed that the wise thing to do would be to shut down the plants for an indefinite period, the employees, however, exacting from the management the pledge that the plants would be reopened at such time as the works council might decide. The agreement to shut down the plants did not come on the first day of the walkout. One of the plants, in particular, persisted in its determination to continue operation, until on the third day the disorder had reached such heights, and so many of the workmen were assaulted on their way to work, that it was clearly necessary to follow the course if bloodshed were to be avoided.

In the Steel Strike of 1919

Only a few months later occurred the great steel strike of 1919. The International Harvester Co. owns and operates the Wisconsin Steel Co., which is located in the very center of the Calumet steel district. On the morning of the first day of the strike more than 75 per cent of the employees of that plant were at their posts, whereas all of the neighboring plants were vir-

tually shut down. Again it quickly became apparent, with tens of thousands of striking steel workers surging the streets surrounding the plant, that continued operation would bring a strife the ultimate consequences of which must surely leave traces of horror in days to come, and again we had the spectacle of the representatives of the employees meeting with the management and deciding that, as a measure of personal and public safety, it was necessary that the great plant shut down.

Its closing was accomplished with the same care and precision with which one would go about the closing of his home preparatory to a vacation. The iron was run out of the blast furnaces and they were banked; all of the hot metal was cast into ingots; all of the ingots were rolled into blooms; the blooms into billets; in short, all of the hot stock was rolled into finished product before the men deserted their posts. In striking contrast to the rest of the district, not a single police officer was asked or permitted on the premises, nor were any persons sworn in as peace officers.

Plant Closed and Opened Again by the Men

The plant was closed for approximately ten days, and during this time it was picketed by representatives of the strikers from other mills on the one side, and on the other were groups of employees of the Wisconsin Steel Co., determined that no destruction of the property in which they were so much interested should take place. The discussions between the two groups of pickets were of tremendous interest. Everywhere the "little gray booklet" outlining the council plan was in evidence and the Wisconsin Steel employees were arguing with striking pickets as to the merits and efficiency of the plan. During this interval the works council met daily.

As the men finally determined that they must insist

upon their rights as American citizens in taking up jobs of their own liking with employers of their own choosing, they sent a notice to all of the employees of the company that the plant would reopen on the following Monday morning. It is a fine tribute to the character of that body of men to be able to state that more than 90 per cent of the former employees obeyed that call on the date specified, and again, the resumption of business in that great steel plant was just as orderly a process as could be conducted under any circumstances. I wish to add that the tons-per-man production in the month immediately following its reopening was the highest in the then history of the plant.

"Grievances" Not a Determinant

These incidents I quote to show the operation of the plan of employee representation in times of strife and warfare, the abnormal conditions under which it was forced to operate.

Against the occasional criticism of single incidents in individual employee representation plans, I would offer the classical comment of the executive of a great transportation system to the shallow survey by a possibly well-meaning, but certainly uncomprehending, critic. This executive said:

A relationship in which grievances are an important factor is not the kind of relationship which the plan contemplates or which exists on our railroad. * * * Our view and the underlying foundation of our plan is that the natural relationship is one of harmony and accord and our plan is conceived and carried out on the threefold basis of mutual faith, facts jointly established, and fair play. To predicate any conclusions on "grievances," as a factor * * * is like judging the health of a city by the kinds of sickness a relatively small number of its people suffer, and by their attitude toward the city's facilities for curing them.

URGES SIMPLIFIED PRACTICE

Ray M. Hudson Addresses Ohio State Foundrymen at Cleveland

CLEVELAND, Sept. 16.—Simplified practice as an avenue of profits was urged before the Ohio State Foundrymen's meeting here by Ray M. Hudson, chief of the Division of Simplified Practice, Department of Commerce.

"Looking at simplification from your angle as purchasers of millions of dollars worth of supplies, machinery and equipment each year," said Mr. Hudson, "a concerted effort on your part to simplify your purchases will unquestionably save money for you. Many of the opportunities for simplification which were reported to Secretary Hoover through the American Society of Mechanical Engineers and the American Engineering Standards Committee cover items that originate in some foundry or are used in foundries. Think of how many varieties there are of each item of supply and equipment, and what it would mean to you if the purchasers of these items of supply and equipment would cooperate with you in their further simplification."

Building on Solid Foundations

While standardization is a slow process, often taking years before the development is complete, Mr. Hudson explained, simplification is immediately applicable in many lines. When simplification is asked by any industry through the division, it was stated, the first step is to get the facts as to the variety of production and the demand for the various items, for it has been generally shown that in the average case 90 per cent of the demand comes from 10 per cent of the variety of products made. The other 10 per cent of demand was declared to cause the extra expense and trouble. Then, with manufacturer, distributor and consumer brought together, they are shown what has been found and they are asked to act. In the first 10 industries, it was stated, the odd and superfluous sizes eliminated represented an average of 86 per cent, yet those industries

are doing more business at lower costs than ever today and their workmen are freed from the worry of seasonal operation.

Frequent Pattern Changes

"As manufacturers," continued Mr. Hudson, "you foundrymen know only too well the grief that comes with the frequent pattern changes which your customers inflict upon you. Perhaps you feel that to suggest simplification to them is more their problem than yours, but when you are bidding for work the question of whether you get the job may be decided by your ability to show the prospective customer how by simplification you can help him get out a better product at lower cost. Oftentimes, simplification of parts would permit you to make them up for stock in quiet periods against the customer's future needs."

Mention was made by Mr. Hudson of the fact that one large railroad system through simplification cut its stocks of supplies from 140,000 to 78,000 items, and he told how purchasing agents of some 40 large roads applied the same principle in cutting down inventories 37.5 per cent and released \$180,000,000 of hitherto "frozen" investment.

War Practices Abandoned

Mr. Hudson paid a high compliment to the work during the war of the nation's foundry industry, but warned that some individual companies are getting away from the war-time practices. He also praised the work of the foundrymen in their efforts to establish a code of uniform trade practices. He urged the appointment of a committee to review the field with respect to its possibilities for reducing present wastes, pledging the cooperation of the Division of Simplified Practice if such action were taken.

In concluding he said: "Simplification is a profit-making policy. It reduces stocks, production costs, selling expenses, investment, seasonal employment and misunderstandings. It increases turnover, promptness of delivery, quality of product, aids in promoting foreign commerce and enlarges profits."

FANS FOR ORE SINTERING *

Severe Service Conditions and Points of Design to Meet Them

There are two general classes of sintering machines for reclaiming ore dust: the rotary kiln or retort type and the stoker type. The former, as the name implies, consists of rotating retort in which the material is placed. Producer gas at high pressure melts and fuses the dust into clinker form. No mechanical draft equipment is required. With the stoker type installation, however, a heavy, high pressure steel plate exhauster is required which acts as an induced draft fan.

The work required of an exhauster in this connection is probably more severe than that required of a centrifugal fan in any other one class of work. This

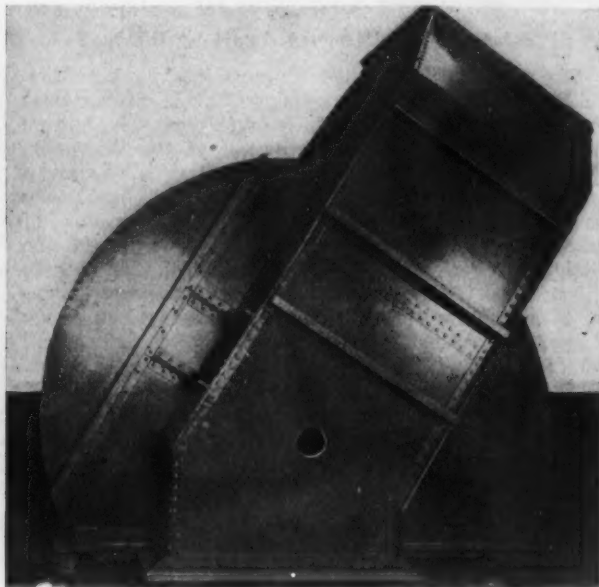
The first of these requirements—that for heavy housing and center plate construction—is based on the size of the fan unit and the varied temperatures to which it is subjected. The housing for this type fan unit, incidentally, is seldom made from cast material.

The need for water cooled bearings with a sintering unit is evident. No attempt is made as a rule to cool the shafts themselves.

The high tip speed required and the high pressure under which the fans operate are more easily understood after reading the following table, which shows the approximate pressures necessary for different thicknesses of bed material:

Bed 10 in. thick.....	23 in. suction
Bed 8 in. thick.....	16 in. suction
Bed 6 in. thick.....	12 in. suction

Because of the powder-like form of the ore being treated in the sintering process, the suction required to



Buffalo Sintering Fan Wheel Is of Center Plate Type. The casing, which provides for double inlet, is reinforced with angle bars

follows because of the high temperature and high pressure under which the sintering fan must operate, both calling for a fan of the heaviest type construction. The dust to be sintered is fed by means of chain grate stokers over the sintering pans which are fired by means of a set of gas flames placed over the grate. The air connections are made below the grate, thereby giving a down draft.

As it is necessary to maintain a high vacuum in the pan below the grates and a comparatively high velocity in the ducts, the air carries a large volume of small cinders and other gritty material which ordinarily would wear out the exhauster in a short time. This is taken care of at times by the use of a centrifugal dust collector on the suction side of the fan which removes most of this heavy material. The iron dust and small cinders have an abrasive effect similar to emery dust, making it necessary to line the air ducts with fire-brick. Sometimes the dust collectors are provided with a false lining, which likewise is covered with fire brick to eliminate abrasive effect.

Sintering fan design and construction are not regarded generally as a standardized process. A cursory examination, however, of the specifications of a group of these units will disclose several important points of similarity in the contract requirements. Most conspicuous of these are the demands for heavy housing and center plate construction—the latter generally being of ½-in. metal—water cooled bearings, high rotational speed and high pressures, and for rivets in the housing and blades that are round headed and hot driven.

*From a monograph by Arthur L. Greene, Buffalo Forge Co., Buffalo, N. Y.

create a draft through this closely packed material is necessarily great. This in turn requires a comparatively high tip speed of the wheel to maintain the proper volume of air.

The advantage accruing from hot riveting the fan housing and blades is evident in view of the thickness of metal used and the great desirability of reducing internal stresses to the minimum. In addition a smooth and, as far as possible, frictionless surface should be maintained with these units, as small cinders, clinker, grit and similar materials passing through the fan at high speed cause wear. For this reason all projecting surfaces are avoided or at least reduced to a minimum.

One type of sintering fan, shown in the accompanying illustration and manufactured by the Buffalo Forge Co., has a removable scroll section to permit the wheel to be taken out. This section is removed by loosening the bolts holding the companion angles, and is placed generally on the opposite side from the outlet. To obtain maximum rigidity of the fan wheel, the blades are riveted to each side of a heavy center plate. This center plate construction is of importance, as well, in lessening the internal stresses within the wheel. The cone shape of the side plates also constitutes a minor reinforcing feature. The more important purpose of sloping the flange, however, is to obtain a narrower width at the periphery of the blade than at the base and by so doing to obtain a more equal distribution of air as it leaves the fan. In place of the usual angle supports for the fan, channel supports are used. Important from the standpoint of preventing vibration is the running balance given all fans of this type. This is doubly important in view of the high operating speed.

Non-Ferrous Metallurgy in America

Recent Developments Discussed Before British Metallurgists

by an American—Nickel Alloys, Bronzes
and Long-Life Molds

(Special Correspondence)

LONDON, ENGLAND, Sept. 11.—The third annual autumn lecture, held under the auspices of the Institute of Metals, was notable for the fact that the lecturer was an American, William M. Corse, of the National Research Council, Washington. The honor which has thus fallen to his lot is a well-merited one, for Mr. Corse is an original member of the institute and honorary corresponding member to the council for the United States of America. The British Institute of Metals has about 150 members resident in the United States and it was from these men, as well as from the membership of the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers that Mr. Corse brought warm felicitations. Considerable interest was aroused among the members of the institute when it was known that Mr. Corse would deliver the autumn lecture this year, and his address was an important feature of the autumn meeting which opened in London on Sept. 8.

Early History of Nickel

Mr. Corse limited his address to a description of the more recent important developments in the United States with particular reference to such subjects as nickel, aluminum, bronze and long-life molds. He traced the origin of the recognition of the value of nickel as a commercial metal to the paper by James Riley, of Glasgow, read before the Iron and Steel Institute in 1889. The steps leading to the publication of this paper are interesting as showing the development of the metal.

Mr. Ritchie, principal owner of the copper-nickel mines in Canada, came in contact in Washington in 1876 with an English inventor, who had an idea of constructing a refrigerating ship to move around the ports in the Gulf of Mexico, take on yellow fever patients and freeze the germs out of them. This inventor needed an alloy to hold ammonia gas and, after looking over the meteorites in the Smithsonian Institution in Washington, decided to try iron-nickel alloys. These proved to be very successful. Recalling these early experiences, Mr. Ritchie came to Great Britain and succeeded in interesting the British steel companies in making some studies of the possibilities of using nickel in steel, which culminated in Riley's paper in 1889, mentioned above. About this same time tests on armor plate between nickel steel and the old compound plate showed conclusively the superiority of the former. These tests established a market for nickel in steel, which stimulated the active commercial development of the metal.

The methods of smelting and refining at the three plants treating ores from the Sudbury nickel field were described by Mr. Corse. In general, the treatment at the smelters, as distinguished from the refineries at the different plants, is identical in principle. The ore is smelted to a low grade matte, containing about 25 per cent nickel and copper, which is then blown in basic converters for the removal of iron, producing a so-called "converter" or "Bessemer matte," which is shipped for subsequent treatment to the refineries. The converter matte usually contains between 78 and 82 per cent copper-nickel and less than 0.50 per cent iron. The balance is almost entirely sulphur. The cobalt is reported as nickel and usually will not exceed 0.40 per cent.

Mr. Corse described fully the three processes for recovering the metal from the converter or Bessemer matte, shipped to the refineries from the smelter—the Orford process, the Mond process and the more recent

Hybinette process—all of them involving the separation of copper and nickel. An interesting phenomenon in the metallurgy of the Orford process is the fact that gold and silver follow the copper, and are recovered in the electrolytic refining of blister, while the platinum group of metals follow the nickel. Typical analysis of the various metallic products are as follows:

	Nickel- Cobalt, Per Cent	Copper, Per Cent	Iron, Per Cent	Sulphur, Per Cent	Carbon, Per Cent
Pig nickel.....	99.00	0.20	0.50	0.04	0.08
"X" nickel shot....	99.10	0.15	0.45	0.025	0.15
"A" nickel shot....	98.60	0.20	0.45	0.030	0.50
Grain nickel.....	97.00	0.20	0.50	0.04	...
Electrolytic nickel..	99.80	0.02	0.15	0.02

In the Orford process the heat loss through the alternate heating and cooling of the product is a considerable factor in the cost of the finished metal. This is in marked contrast to copper metallurgy where practically all of the refining is done without cooling between steps and helps to explain in some measure the difference in cost between the two metals.

The Mond product averages 99.50 per cent nickel and has a characteristic onion-like structure, due to method of production. The residue from the volatilizer, consisting of copper and nickel, is melted down with sulphur to a copper-nickel matte and reverts to the initial step in the process, i.e., similar to Bessemer matte.

Nickel from the Hybinette process is produced primarily in the form of electrolytic cathodes about 20 x 30 in. Electrolytic copper is the by-product. As in the Orford process, a number of steps are necessary before the final production of the metal both in the Mond and Hybinette processes.

During the past 15 years the world's production of refined nickel has probably averaged 40,000,000 to 80,000,000 lb. per year, and the approximate distribution of this tonnage, prior to the signing of the naval disarmament treaty, was: For nickel steel ordnance, 60 per cent; nickel-silver and copper-nickel alloys, 25 per cent; nickel plating (anodes and salts) 5 per cent; malleable nickel, 5 per cent; miscellaneous, 5 per cent.

Developments in Monel Metal

Monel metal, containing nickel and copper in the proportions that they occur in the ore, i.e., 67 per cent ni, 28 per cent cu and the rest iron, manganese and carbon, has found commercial application chiefly because of its resistance to corrosion, its natural strength and hardness, and its retention of these properties at elevated temperatures, particularly those of superheated steam. But Mr. Corse points to its limitations and adds that it is by no means the panacea for all corrosion problems. It is readily soluble in concentrated solutions of the mineral acids, it does not resist the action of molten metals, nor will it retain its physical properties in the presence of elemental sulphur at elevated temperatures.

Aluminum Bronzes

Mr. Corse next dealt with the development of the copper-aluminum alloys known as aluminum bronze, and described the scientific work on these alloys done in England and America. For structural purposes he regards the formula:

Copper, 87.5 per cent; aluminum, 9 per cent, and iron, 3.5 per cent.

as one of the best, but for such articles as worm gear wheels, where a certain type of structure is necessary for wearing qualities, it is considered better to keep

the aluminum content between 10 and 11 per cent with the addition of iron only where extra hardness is required.

In copper-tin alloys with about 10 to 12 per cent of tin, there is a relatively large difference in temperature (about 300 deg. C.) between the solidus and the liquidus curves. This gives a plastic condition on cooling which makes these alloys hot short during the setting range. This property makes them very difficult to cast in metal molds and also prevents them from being forged or rolled.

Aluminum bronzes, on the other hand, have a very small difference in temperature between the solidus and liquidus curves, which indicates a freedom from hot shortness and a good ability to be rolled and forged. These indications are confirmed in commercial practice. Mr. Corse claimed that it is easily possible to get 10,000 castings of aluminum bronze from one impression in the mold before it is worn too badly to reject it.

The advantage of aluminum bronze over phosphor bronze for worm wheel gears is the increased tensile strength resulting in decreased weight with reduced cost. Phosphor bronze of about 89 per cent copper and 11 per cent tin has proved an excellent gear bronze and in many cases has so far proven the best. The demand, however, for a stronger material to withstand the shocks put on worm gearing, particularly in the heavy dump truck service, has stimulated research work with the aim of improving the straight copper aluminum worm gear bronze for heavy duty work.

Effect of Lead on Aluminum Bronze

Mr. Corse described some recent tests of a regular aluminum bronze with the addition of 1 to 2 per cent of lead, which indicate that this combination will equal if not excel the phosphor bronze in wearing qualities when cast in the same size piece. Preliminary tests indicate also a slightly lower coefficient of friction.

The physical properties of a test piece cut from the center of a gear weighing 60 lb., whose section was approximately $2\frac{1}{4} \times 3\frac{1}{4}$ in. are as follows:

Yield point, lb. per sq. in.	\$1,200
Ultimate strength, lb. per sq. in.	\$2,800
Elongation in 2 in., per cent.	15.0
Reduction in area, per cent.	15.7

The average strength of the phosphor bronze for this service is about 30,000 lb. per sq. in.

Long Life Molds

Mr. Corse next dealt with the problem of long life molds for the foundry and expressed the opinion that the Holley Carbureter Co. of Detroit had come nearest to putting the permanent mold process on a commercial basis. These are molds made of cast iron about $\frac{1}{2}$ in.

thick used in making an intricate iron casting weighing 2 lb., with numerous bosses and with a thickness of the metal walls varying from less than $\frac{1}{8}$ in. to more than $\frac{1}{2}$ in. This casting had to be free from blow-holes and porous spots and had to be uniformly soft throughout. The Holley company developed during the past three years a machine for making these castings in iron molds which has proven a commercial success. Castings from other patterns as well as being regularly produced with an average foundry loss of from 7 to 8 per cent. [Plant and process described in THE IRON AGE, May 3, 1923.]

The machine used is a circular revolving table carrying 12 molds which are opened and closed on a horizontal axis by means of cams. This machine will produce 2000 castings in 5 hr. with unskilled labor, which is about eight times as many as can be produced by sand molding by the same number of men in the same time. As already stated, the molds are $\frac{1}{2}$ in. thick and are cast from the same iron as is used in the castings themselves. They have radiating fins cast in the back and are subjected to a blast of low pressure air when in operation to help radiate the heat imparted by the molten metal. Once the molds are heated to the desired temperature no difficulty is encountered in keeping them within the temperature range required to prevent expansion strains or cracks.

Large Yield of the Molds

The cost of a master mold which is made from a wooden pattern is about \$30, and the cost of a pair of production molds is about \$8. Ordinarily from 8000 to 10,000 castings can be poured in a set of molds, while as many as 20,000 to 25,000 have been cast in a single pair.

The face of the mold is coated with a thin mixture of water, fireclay and water glass baked on in layers until the total thickness is about $\frac{1}{65}$ in. This acts as a heat barrier and is an important factor in controlling the rate of cooling of the casting. This coating has to be repaired occasionally, but usually lasts a month without renewal. The clay coating is protected by a thin layer of lamp black produced by a smoky flame, and is renewed after each casting.

This process gives a means of controlling the cooling rate of the casting, which is the key to the whole problem, and furnishes the foundryman with a new tool with which to work while enabling castings to be made that are impracticable with sand. An interesting result in the case of cast iron is that the foundry shrinkage is found to be about one-half that of a sand casting. This same reduction in shrinkage is noticed with aluminum and brass castings and, because of this and other reasons the process would seem to be adapted to casting these metals as well as iron.

Course in Heat Treatment Conducted by Philadelphia Steel Treaters

A course in the heat treatment and metallography of steel is to be conducted this year under the auspices of the Philadelphia chapter of the American Society for Steel Treating at Temple University, Broad Street and Montgomery Avenue, Philadelphia. Realizing that the rapid advancement in the science of heat treating steel has made it difficult for the practical man to keep informed on the subject, this chapter in 1921, with the cooperation of Temple University, inaugurated an evening course, and it is to be continued this year on a broader scope than in the past. The full course will consist of 30 lecture periods and six laboratory periods. One lecture period of one hour and two laboratory periods of two hours each will be given each week for 30 weeks. There will be lectures by leading metallurgical authorities which will cover various phases of the subject. The laboratory work will supplement the lectures as well as give the student practical experience in various phases of the subject. Fundamental principles will be emphasized and certificates will be issued to those who complete the course satisfactorily.

The tuition for the full course of 30 lectures and six laboratory periods is \$40, with \$20 the fee for the 30 lectures without the laboratory work. Further information can be obtained from H. C. Knerr, chairman, or A. W. F. Green, secretary-treasurer of the chapter. It is also stated that the course will be given by mail under the auspices of the Philadelphia chapter.

Jones & Laughlin Activities at Hammond, Ind.

That the Jones & Laughlin Steel Corporation, Pittsburgh, contemplates early construction of a plant on its 1200-acre site at Hammond, Ind., is indicated by additional evidence which has come to hand. The Pennsylvania Railroad has purchased a right-of-way from its main line at Indiana Harbor and East Chicago, Ind., to the Jones & Laughlin site, a distance of nearly two miles. The Jones & Laughlin company itself has purchased the right-of-way for the construction of a large underground outlet sewer and drain extending from its property to Grand Calumet River, a distance of one mile.

Flexible Tariff Plan Not Operating

Enforcement of Provisions Beset with Difficulties—Investigation of Cost of Making Pig Iron Halts—Results Declared Worthless

BY L. W. MOFFETT

WASHINGTON, Sept. 16.—Taking the tariff out of politics and politics out of the tariff long has been a pet phrase. Approval of the sentiment appears to have been general over the country and among industrial and commercial organizations. So strong did it become that it brought about the setting up of a so-called non-partisan Tariff Commission under provisions of the revenue act of Sept. 8, 1916. The body is made up of six members. Under the act, not more than three members are permitted to be of the same political party. The commission was organized early in 1917. Its powers as then constituted were limited. It was without authority either to make or recommend rates of duty. It remained for Congress to draw conclusions and establish rates as the result of the investigations and reports of the commission, to which its activities were confined. Its reports related to conditions to determine the competitive nature of domestic and foreign industries. The contention was that under the constitution Congress alone was empowered to levy taxes and as tariff duties are a source of revenue, it was for Congress to assess imposts.

Commission Recommendations

With the commission under way, it forwarded to Congress reports intended to be systematic in character and expertly informative, chiefly dealing with economic and industrial conditions pertaining to industries that would be affected by tariff legislation. Proposed administrative features also were suggested by the commission and these afforded the framework for a distinct turn in American tariff making. The outstanding development culminated in a sharp departure, the provision in the Fordney-McCumber act of 1922—the present law—for so-called flexible rates. This was made possible by the advocacy of the plan by President Harding, who urged it strongly in the course of a message delivered to Congress on Dec. 6, 1921. It greatly enlarged the powers of the Tariff Commission and likewise vastly increased its responsibilities, for it gives to the commission authority to recommend change in rates of duties following investigation. President Harding, after reciting his reason for asking that authority to recommend changes in rates be given the commission, took into account the objection to such a grant of power under the allegation that it would violate the constitutional authority of Congress.

"I hope a way will be found to make for flexibility and elasticity, so that rates may be adjusted to meet unusual and changing conditions which cannot be accurately anticipated," the President told Congress. " . . . I know of no manner in which to effect this flexibility other than the extension of the powers of the Tariff Commission, so that it can adapt itself to a scientific and wholly just administration of the law.

"I am not unmindful of the constitutional difficulties. These can be met by giving authority to the Chief Executive, who could proclaim additional duties to meet conditions which the Congress may designate.

"The grant of authority to proclaim would necessarily bring the Tariff Commission into new and enlarged activities, because no executive could discharge such a duty except upon the information acquired and recommendations made by this commission. But the plan is feasible, and the proper functioning of the board would give us a better administration of a defined policy than ever can be made possible by tariff duties prescribed without flexibility."

The absolute sincerity of President Harding, the

appeal of his logic to the public mind and the hope that this was a further step to take the tariff out of politics prompted a more or less reluctant Congress to respond and an amendment to the Fordney-McCumber bill was introduced in the Senate with the approval of President Harding in January, 1922, authorizing the President to modify the tariff rates provided for in that bill by increasing or decreasing such rates to the extent of not more than 50 per cent, when such modifications were found necessary in order to equalize "differences in conditions of competition in trade . . . in the United States and competing foreign countries." The flexible provision was thus set up as Section 315, after the words "differences in costs of production" were substituted for the words "differences in conditions of competition in trade." The section provides that the President, following investigation by the commission, may in the event the need is shown, increase or decrease the present rates of duty and may even change the present classifications of articles in order to "equalize" costs of production in this country and the principal competing foreign nations. Should it be held impossible to equalize the costs in this manner, the President is authorized to substitute, for the purpose of assessing duties, the selling price of competitive American articles in the principal American markets instead of foreign or export value of the articles. Provision also is made that no rate shall be increased or decreased more than 50 per cent of the rate carried in the act; or increased at all if the American selling price is substituted; or changed in form, and that there shall be no transfer from the free to the dutiable list or vice versa. Other highly important sections with new features in tariff legislation were enacted, but the flexible provision has been the most sweeping and has had most attention centered upon it.

The Tariff and Politics

It was looked to as being the great source of removing the tariff from politics. But operation under the provision has been beset with sharp disputes within the commission, which continue. Conflict of views prevails on some points, involving high or low protection, and recommendation to such end, within the commission. The division is claimed invariably to have arisen from a political viewpoint. Work of the commission has been delayed owing to these differences and some has been obstructed to the point of being considered valueless by industries and other affected. The chief action taken has been on agricultural products, an example of which was the proclamation by President Coolidge of a 50 per cent increase in the duty on wheat. So sharp did conflict become within the commission in March, 1923, it was deadlocked for a protracted period over its powers under the flexible provisions. President Harding was forced to settle the dispute when he held with the so-called Republican wing of the commission that it did not possess authority under its own initiative to institute investigations under Section 315 and make recommendations for changes in rates. Such investigations, it was determined, can be made only upon the filing of applications by industries or others concerned. Other conflicts have risen repeatedly and now there are in controversy points connected with investigations.

Politics and the Tariff

The retarding of constructive work through these differences has caused an undoubted reaction against

the feasibility of a Tariff Commission and particularly as to granting it authority under the flexible provision to recommend changes in rates. It has developed the identical thing opposite to that which President Harding had hoped or thought it would do. There are those who maintain that the practicability of both a commission and the flexible section still exists, but that, like any human institution, it is dependent upon methods of application. This school of thought does not by any means concede the accuracy of the claim of the skeptic that the tariff cannot be taken out of politics. Nor do they share the view that has found expression here that the conflicts within the commission and its failure to act as promptly as occasion requires mean the possibility that a protectionist Congress, if the next Congress should be of that complexion, will attempt to take away from the commission the wider powers given it under the present law and restore it to its old position of having powers of investigation only. There has even been talk that should conditions be favorable an element in Congress might even seek to abolish the commission. This latter possibility has not been given any great weight. In any event it is felt that any action Congress might seek to take would be based upon what the party in control would consider to be representative of prevailing public opinion. Perhaps there is no subject that can develop more views than that of the tariff. It always has been so and no reason prevails for thinking a change will come about, though it is doubtful whether the views are so violent one way or the other as they were when the tariff was a larger factor than now in politics. That was when American industry was young and struggling.

Thomas Walker Page, late chairman of the Tariff Commission, and now one of the Council of the Institute of Economics, has just come out with a statement urging that the commission be given even greater power than it now has. He makes the point that "Every (tariff) act has been bitterly criticized, even by members of the party that enacted it, because they felt they had been defrauded by the adoption of a tariff that did not fulfill the pledges on which the party had gained power."

Not Guilty of Perfidy

"That the party has not kept entire faith with those that supported it is usually true," continues Mr. Page, "but failure to do so is also usually due not to the perfidy of Congress but to fundamental errors in the methods of tariff making. Under the prevailing method, it has been utterly impossible for Congress to know what rates of duty would fulfill the pledges that had been made. Lacking necessary information, members cannot combat arguments urged by representatives of the 'interests,' who are familiar with every detail of the industry for which they appear, but who are bent on securing advantages rather than on explaining the whole truth."

Mr. Page went on to declare that, unable to dispute the assertions of these representatives, "the average member of Congress is practically compelled to vote either according to what he thinks his district wants or else give the industries affected what they ask for."

Revision of work of the Tariff Commission is suggested by Mr. Page as the remedy for the state of affairs he described.

"The commission should be required to assemble and interpret the sort of information that has been lacking," says Mr. Page. "Instead of being forbidden, as at present, to suggest rates of duty, it should be directed to point out what duties are needed and what effects the duties may be expected to have. The duties to be designated should be those which enable foreign and domestic industries to compete on equal terms. But the commission should furnish Congress with facts needed to judge whether such duties should be enacted into the law."

"These duties are not controversial nor partisan," concludes Mr. Page. "They are purely statistical. They are not intended for insertion into a law as they stand. They are intended as a base on which either a protective or a revenue tariff can be built. Their advantage is that, in using them, both parties would stand on a

basis of fact, from which they may—and undoubtedly will—draw different conclusions, but from which neither of them can be pushed by the misleading claims of sectional, factional, or industrial interests."

Newly Created Powers

Opposed to the views of Mr. Page and those of the same trend of mind, are many who would like to see the commission shorn of some of its newly-created powers. Among them are certain agricultural interests which have resorted to action under the flexible provisions to a much greater extent than any other section of the country. But even the farmers are divided and have shown a rather sharp difference of opinion, which has developed to a marked degree since the sugar investigation was made. One contingent of the agricultural community wants immediate reduction of the sugar duty. This is the attitude of the Fair Tariff League. Then along comes another highly important farm organization, the National Producers' Federation, whose chief spokesman, Charles W. Holman, has written a letter to President Coolidge protesting against the methods of the commission in studying the sugar question and asking that the President send the report back to the commission for further study. In substance, the President is urged to withhold action. Mr. Holman also says the flexible provisions are a failure and should be repealed. The divergence of views even within the farmers' ranks themselves is said to be a source of embarrassment to the President. There are those who say that the sugar issue, like many others, is not bound up from A to Z in the tariff at all, but instead is a question of the law of supply and demand and that the question of low or high protection is a mere incident. The confusion and heated controversies over this and other questions at the same time have developed political color, though on sugar at least it is not really a partisan matter. But when these considerations are recalled there are those who say it is not unnatural that the Tariff Commission itself should have its own conflicts of views which cause delay in action or failure to complete work.

Cost of Making Pig Iron

In this connection, it is indicated that the application of Eastern merchant blast furnace interests to have the duty on pig iron increased 50 per cent under the flexible provisions has been for nothing. It will be remembered that agents of the commission from its metals section made a rather exhaustive study through personal contact and by means of questionnaires of costs of production in this country of pig iron. They were helped in every way by domestic producers, who, like the commission itself, went to considerable expense to gather the data. It was intended then to take up a study abroad. The work in this country was begun in the spring of 1923. It was completed in August of last year. Since then nothing has been done. And nothing further is under contemplation at present, if at all, so far as can be learned. Since the work was started in this country, conditions have changed to such an extent that the facts gathered are considered to be obsolete and worthless. The situation as to imports, rate of operations, wages, costs of coke, prices, etc., are altogether different both in the United States and abroad. It is not believed that the facts gathered at furnaces in the United States would be sufficiently up-to-date to afford a safe basis to make anything like an approximate of the actual cost of producing pig iron under present conditions. The agitation for a higher rate came at a time of heavy imports when domestic furnaces were either out or banked on a widespread basis owing to the coal strike and demoralized transportation.

No Protest Made

The inactivity of the commission in the pig iron case, it is said, has not created any protest from the industry, and this is held to be a possible reason for its not making plans to continue the work. Such plans apparently would make it necessary to start all over again and if they are to be effective would call for

quick work because of quickly changing conditions here and abroad. Some are of the opinion that the rapid swings in industrial conditions nullify to a great extent the work of the commission when it has to do with the proposal to change rates. In other words, they question the effectiveness of flexible provisions unless they can be acted on almost over night through only

the most fundamental facts at the disposal of the commission. And there are those who say these questions are far beyond a mere matter of high or low protection or free trade. They are held by this contingent to be economic issues that will never yield in their entirety at least to anything but natural laws without regard to politics in or absent from the tariff question.

Cast Iron Pipe Manufacture in the South*

Sand-Spun and De Lavaud Processes at Birmingham Described and Compared—Our Total Production

BY DR. RICHARD MOLDENKE

NO single branch of the foundry industry has been brought to a production basis of huge tonnage, low manufacturing cost, and producing material of a remarkably high quality, as has the making of cast iron pipe. The pipe shop is an excellent illustration of the fact that repetition work in specialties leads to mechanical equipment and manipulation which lower production costs to an astonishing degree. Hence cast iron pipe, in dull times, has been sold at a few dollars a ton over the selling price of the pig iron used. On the other hand, these same pipe shops make fittings of many varieties, and in much smaller quantities, where the cost is high, and when pipe may be sold, say, at \$50 a ton, the fittings on the same shipment will be sold for nearly double that price.

Development of the Industry

The history of pipe making, in the United States, is a checkered one—the mortality of plants is high and, from the nature of the industry, plants must be large to live. In spite of the fact that the best processes must be used to turn out this rather strict specification material, pipe is easy to make and a pipe plant is more of a tonnage mill than the really high-class specialty foundry it should be. Every time, therefore, that the demand for pipe is strong new shops spring up, only to close when the demand has ceased, but the financial damage to the more permanent plants has been done. Both the South and the North have had abundant experiences of this kind, and when recently a Northern Public Service Corporation gave its order to France, the pipe plants thus adversely affected were content to have this occur rather than see a plant started to supply the surplus demand.

The heavy fluctuations in the production of cast iron pipe, because of the alternation of bad and good times in this country, also the irregularity with which orders are placed for extension requirements of the large municipal water-supply developments, have tended to put out of business all those establishments that were not advantageously situated for either rock-bottom cost of supplies, or specially good shipping locations. Thus, while the Southern plants, located in the Birmingham district, have the advantage of cheap pig iron, coke and labor, those of the Delaware River can ship by water all over the world. To obtain a steadier production, individual manufacturers have tried to branch out into special lines—to have cast iron pipe replace steel pipe. Much of the conduit work in oil refineries is made of cast iron; for corrosive waters, even where high pressure is involved, cast iron does better than steel; and for some purposes cast iron pipe is now furnished with a cement lining.

Perhaps the most striking development, in recent years, in this industry has been the manufacture and introduction of centrifugally cast pipe. Two distinct methods are now in use, and both are in daily operation

on a commercial scale so far only in Birmingham, Ala. The original plant of the first process introduced in the United States is at Burlington, N. J.; it is understood that this plant is to be greatly enlarged in the immediate future. This process is named from its inventor, de Lavaud, and consists in rotating a steel mold at high rate of speed, introducing therein the proper quantity of molten iron which, through centrifugal force, is spread over the mold and thus makes the pipe. The other centrifugal process, the so-called "sand-spun" method, substitutes a sand-lined mold for the steel in the de Lavaud method; it thus gets a closer approximation to the old way of making pipe. Both methods obviate the use of cores. The chilling effect of the steel mold on the molten iron is overcome by a subsequent short anneal at high temperature.

De Lavaud Centrifugal Pipe

The use of centrifugal cast iron pipe is spreading rapidly. The idea is old, for patents in England date back a hundred years. The developments, however, were never successful commercially, until de Lavaud worked out a combination of detailed operations that overcame the difficulties of pouring iron into a metal mold and getting serviceable results. The main trouble was to get the molten metal spread evenly over the inner surface of the rapidly revolving steel mold within the time available before this metal would set. The object was accomplished by introducing, all the way into the mold, a refractory-lined spout which carried the molten metal, from the special ladle that held it, the right amount of iron, and withdrawing it at a uniform speed while the metal was flowing into the mold. This gave a flat spiral of metal which remained fluid long enough to have the edges jointed without a "cold shut" and thus made a perfect pipe. The indications of this spiral formation can be seen on the inner surface of the pipe.

The bell end of the pipe is fashioned by placing a core of the proper shape in the far end of the mold; to allow withdrawal after setting, the spigot end of the pipe is left straight. A groove can be cut into the pipe subsequently to provide for the joint. The mold is made of nickel-chrome steel with about 0.30 per cent carbon, and is revolved by a Pelton wheel attachment, which allows great flexibility in operation. Cammen has given a formula for the speed revolution for pipe of various diameters, thus:

$$R. p. m. = \frac{1550}{\sqrt{R}}$$
 in which R is the inner radius of the mold.

At the present time, centrifugal pipe is made in sizes from 6 in. to 12 in. in diameter, and preparations are under way to make 4-in. pipe.

In operation, two points of the apparatus need close attention:

The roller bearings of the mold require the best skill of the steel metallurgist and heat treater in their production.

The molds, through constant heating and cooling

*From a paper to be presented at the Birmingham, Ala., meeting of the American Institute of Mining and Metallurgical Engineers in October.

of the inner surface, develop fire cracks, which eventually make the withdrawal of the pipe difficult; hence the life of the molds is limited, though some astonishingly long runs have been recorded.

As the pipes are withdrawn from the molds, they roll automatically into the annealing oven where they remain for 20 min. The oven is maintained at a temperature of 1750 deg. Fahr. The revolving of the pipe prevents bending.

From the nature of the process, the walls of the pipe are not thick; the carrying capacity of the steel mold in withdrawing heat is overtaxed when too much metal is introduced, thus time is lost in the final setting of the excess metal. On the other hand, centrifugally cast metal is very dense and sound, so that the strength is higher, while through a subsequent anneal the machinability of the metal is restored when the metal mold has been used. The density and nature of the metal, it is claimed, retard the influences for corrosion of the pipe, so that the risk otherwise taken in laying many miles of a lighter pipe may not be serious. The future alone can show if this is so.

Advantages and Disadvantages

Centrifugally cast pipe has a manufacturing cost fully as large as that of sand-cast pipe for, while the core is obviated, the use of metal molds means an annealing expense. Further, there is the royalty under the several patents. The advantages of centrifugal cast iron pipe, with steel molds, are:

- Because of its lightness more miles of the pipe may be laid for the same cost.
- Higher quality of the metal, all impurities being driven inward as the metal sets against the metal mold surface, as also from centrifugal action.
- Less corrodibility.
- Avoidance of a core.
- Reduction of labor in manufacturing.
- Saving in foundry space.

The disadvantages would seem to be:

- The possibility that improperly annealed pipe can get through occasionally.
- That it is not a convenient commercial proposition to make this kind of pipe thick.
- That the corrodibility cannot be determined satisfactorily for a number of years.
- That the testing of this class of pipe is still unsolved.

These objections by no means militate against the development of this product, but are given to show that side of the problem. It is unquestionably true that cast iron, when poured into a metal mold, does not get the same chance for the unrestricted development of its physical qualities as when going into sand molds.

The New Sand-Spun Centrifugal Pipe

The "sand-spun," cast iron pipe is just appearing on the market. Here, the revolving mold consists of a steel container (flask) lined with sand of the kind ordinarily used in the pipe foundry. Cores for bell and spigot are placed in the ends of the mold and the metal is poured into the mold without the use of a special spout, as the iron has time to spread properly before setting. The somewhat damp sand surface of the mold is dusted automatically with a little cement, which hardens the surface sufficiently to withstand the cutting of the molten iron until the velocity of the mold has been acquired. When set, the pipe is withdrawn with the destruction of the sand lining of the mold, so that the mold must be relined each time with new sand. But the iron has the advantage of setting as it would in the ordinary sand-casting process, apart from the centrifugal action on the metal itself. In this process, also, no core is used; in addition, no annealing is necessary.

The process, while turning out pipe commercially, is not fully developed, as two points require some special safeguarding. Thus, when the ladle of metal is poured into the mold in either the revolving, or from the quiet state into the revolving, it takes a little time for the molten iron to acquire the same velocity as the mold; during this period the iron repeatedly drops back into the pool on the bottom. This effect, and the time required for the metal to set, which is greater than when iron goes into a metal mold, approximate what happens when iron is poured into an open-sand mold. There is more or less surface oxidation, with bad looking surfaces resulting. Inasmuch as slag and dirt are forced inward through centrifugal action, the inner pipe

surface is affected correspondingly. For marketing the pipe, the pipe is lined with cement, which is fastened securely to the pipe by reason of this roughness.

Advantages of New Process

The advantages of the "sand-spun" cast iron pipe seem to be the following:

- Molten metal gets time to set properly, as in sand molds.
- Added advantage of density from centrifugal action.
- Avoidance of the core by the centrifugal method.
- Ability to make thick pipe if desired, and to have a spigot end.
- No special difference in corrodibility as compared with ordinary cast iron pipe, nor requirement of higher silicon, as with the de Lavaud method.
- Annealing is not necessary.
- Some labor reduction over ordinary sand method.

The disadvantages are:

- Because of the time of setting, considerable surface oxidation takes place, making the pipe interior rough.
- Necessity, until process has been developed further, of cement coating of interior—though this, in itself, is an advantage where cement-lined pipe is desired.

The future development of these two basic processes will be watched with the greatest of interest, as huge values are involved and the material and product enter civilized life so vitally. For the moment the tonnage, though respectable, is but a small part of the production of this branch of the foundry industry, and centrifugal cast iron pipe is made—so far as the writer is aware—only in Great Britain, the United States, and Canada. Germany is testing a development similar to that of de Lavaud, so far as one hears of it; France and Belgium have not entered this field commercially.

The Country's Production

The total production of American cast iron pipe, in 1921, could be set at 800,000 tons, of which 250,000 tons was used as soil pipe and for conveying gas; 550,000 tons was used as water pipe, of which half was used in large city water-supply work. At present, the output of the American plants (all of them are now running practically full) is 50 per cent higher, or probably on the basis of 1,200,000 tons per annum total. The distribution percentage is about on the same basis as it was for 1921.

The Southern plants, with their estimated capacities for water and gas pipe, are as follows:

	Tons per Year
Plants of the United States Cast Iron Pipe & Foundry Co., at Birmingham, Anniston, Bessemer, Ala., and Chattanooga, Tenn.	400,000
American Cast Iron Pipe Co., Birmingham, Ala.	120,000
National Pipe & Foundry Co., Birmingham, Ala.	60,000
Lynchburg Foundry Co., Anniston Plant, Ala.	25,000
Total	605,000

It is estimated that the Northern and Southern production capacity are about equal at the present time, with contemplated large additions for centrifugally cast pipe in the North.

Receivership for Haynes Automobile Co.

After a petition was filed in the Federal Court at Indianapolis, asking that the Haynes Automobile Co., Kokomo, Ind., be declared bankrupt and a receiver appointed, an agreement was made with the Apperson Automobile Co., Kokomo, which will take charge of the Haynes plant and continue operations. Creditors of the Haynes company were offered settlement at 15 cents on the dollar and many have accepted.

President Don C. McCord of the Apperson company said that the Haynes plant will resume operations at once and that a new company will be organized as the Haynes Motor Corporation. Haynes contracts with other manufacturers are to be continued according to the agreement. Bankruptcy proceedings were brought by Thomas J. and B. F. McIntyre and H. Merrifield, representing claims of the Chicago Tool & Kit Mfg. Co., operating as the Grinding Wheel Clearing House of Chicago. It alleged that the company had an indebtedness of \$4,602,000 and placed the value of assets at \$2,602,000. It also alleged that the company has operated at a monthly loss of \$60,000 since last January.

Crankshaft Lapping Machine

Two new lapping machines, made by Charles H. Besly & Co., 118 North Clinton Street, Chicago, have been produced, largely for the use of automobile builders. Both these are known as No. 44, one having three heads, while the other has two heads. The three-head machine is used for lapping line bearings, while the two-head machine is used on throw bearings. The three-head machine is shown in the illustration.

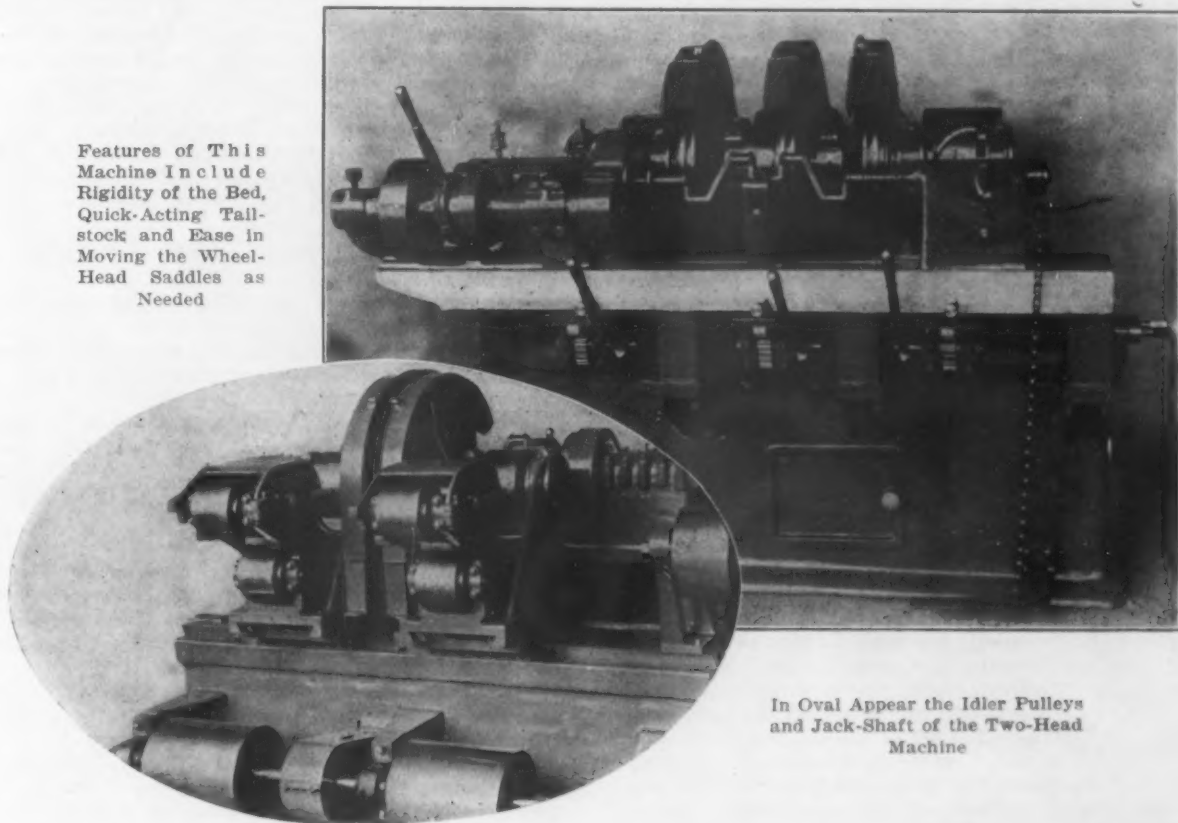
With a machine bed $66\frac{1}{2}$ in. long, 19 in. across the ways and 26 in. high, the work table is 71 in. long and $8\frac{1}{2}$ in. wide. The bed has a dovetailed ways machined on top to receive the adjustable saddles that carry the wheel head slides. The work table is carried on four supports cast on the front of the bed. This

end of the bed. The wheel head slides are mounted on long dovetailed guides on top of the saddles, with tapered gibs for adjustment. The front end of the slides has a rack and pinion movement controlled by an operating lever, for moving the wheels to and from the work. Stop screws in the table casting regulate the pressure against the work.

Hard Felt Wheels Used

Equipped with ball bearings inclosed in dust-proof housings, the wheel-head spindles are amply large. The driving pulleys on the spindles are 8 in. diameter by 4 in. face. The two outer spindles are equipped with a taper nose for attaching the wheel spiders, which carry 24 in. diameter hard felt wheels. The spider flanges fit into a recess cut into each side of the felt

Features of This Machine Include Rigidity of the Bed, Quick-Acting Tail-stock and Ease in Moving the Wheel-Head Saddles as Needed



In Oval Appear the Idler Pulleys and Jack-Shaft of the Two-Head Machine

table has a $13/16$ -in. tee slot its entire length for taking the crank-driving head and tail stock, the driving mechanism and supporting rests.

How the Work Is Driven

Mounted on the left end of the work table, the crank-driving head has driving pulley mounted on a friction clutch sleeve, provided with a taper nose. When thrown to the right, this disengages the clutch and engages a stationary friction cup, which stops the work spindle. The clutch-driving shaft has a spiral gear on one end, engaging in a larger spiral gear attached to the work-driving spindle. All backlash in the gearings is taken up by eccentric bearing bushings on the driving shaft.

Having a face plate for attaching various kinds of work drivers, the work-driving spindle, $2\frac{1}{2}$ in. in diameter and $19\frac{1}{2}$ in. long, has also a center for carrying the work. Its bearings are of phosphor bronze, equipped with sight feed oilers, a ball bearing being used for thrust. The tail stock is of the quick-acting type, actuated by a compression spring and cam lever movement. It can be operated by hand or foot lever. A locking clamp is provided so that the spindle can be set for sliding movement or can be rigidly clamped. The work rest has two hard wood blocks, adjustable to any size crank. It can be clamped on the work table at any point between the centers.

All three wheel heads are mounted on saddles which can be moved to various points on the machine bed, this movement being controlled by screws from each

wheel, so that they will not project and interfere with the crankshaft cheek. The center head spindle has the wheel spider attached directly to a flange on the drive pulley. Space here is limited and it is necessary to run the wheel between the bearing housings. As this spindle must be removed when changing wheels, a quick clamping device is provided.

For use with this machine, the lapping wheels are of hard white felt, charged with powdered glass or other powdered abrasives, as desired. They are of suitable width to cover the bearings and without endwise movement, except when specially required. The wheel spindle speed is 1500 r.p.m., and the crank spindle speed 320 r.p.m. The jack shaft back of the machine runs at 1200 r.p.m., being $1\frac{11}{16}$ in. diameter by 72 in. long. Power is transmitted to the wheel spindles by leather belts 4 in. wide, passing over two stationary ball-bearing idler pulleys and a third swinging idler pulley.

The same description, modified to suit details, applies to the two-head machine, except that the crank spindle speed in that machine is 150 r.p.m.

The August payroll by industries at Youngstown of \$5,684,222 represents the largest disbursement since April, and is an increase over July of \$116,728. It compares with \$7,199,160 paid in April this year, representing the high mark since 1922. For the first eight months the wage distribution was \$51,286,144, compared with \$50,527,895 for the corresponding period in 1923.

TO SIMPLIFY WAREHOUSING

Important Conference to Be Held at National Capital This Month

WASHINGTON, Sept. 16.—Embracing 36 States and three organizations in Canada with headquarters in 100 cities, including iron and steel manufacturers, foundrymen, machine tool interests and related industries, together with banking organizations, trade associations, and distributing groups and transportation bodies, invitations have been sent out by the Division of Simplified Practice to an important conference here on Sept. 24. It is to be held with the public warehouse industry to consider the simplification of the present numerous forms used in warehousing and to act on uniform documents for the warehouse industry which have been prepared after nearly two years of study by a special committee of the American Warehousemen's Association headed by A. H. Greeley, Cleveland.

Present diversity in such forms is a direct cause of confusion, lost time and errors, it is claimed, and the conference will be the culmination of a movement to obviate these losses. The conference has the backing of the Department of Commerce, members of the American Bankers' Association, the Chamber of Commerce of the United States, the National Distributors' Association, freight claim organizations of transportation interests and business groups generally. The meeting will seek to have made uniform certain documents, notably negotiable and non-negotiable warehouse receipts generally used in business dealings between warehousemen and distributors who use public merchandise warehouses.

Among those invited to the conference and their headquarters are:

New York: American Hardware Manufacturers' Association; American Iron, Steel and Heavy Hardware Association; American Staple Manufacturers' Association; American Supply and Machinery Manufacturers' Association; American Tack Manufacturers' Association; American Trade Association Executives; Associated Manufacturers of Electrical Supplies; Association of Lock Washer Manufacturers; Electric Hoist Manufacturers' Association; Foundry Supply Manufacturers' Association; Electrical Manufacturers' Council; National Association of Manufacturers; National Association of Purchasing Agents; Motor Truck Association of America; Motor and Accessories Manufacturers' Association.

Chicago: American Railway Association; Automobile Manufacturers' Association; National Association of Brass Manufacturers; Page Fence and Wire Products Association.

Philadelphia: Drop Forge Supply Association; National Hardware Association of the United States; National Supply and Machinery Dealers' Association.

Pittsburgh: American Shovel Institute; Association of Tin Plate Manufacturers; Enamel Sanitary Ware Manufacturers' Association; National Association of Sheet and Tin Plate Manufacturers; National Pipe and Supplies Association; Railway Supply Manufacturers' Association.

Providence, R. I.: Conveyor Manufacturers' Association.

Boston: New England Iron and Hardware Association.

Cleveland: American Pig Iron Association; Foundry Equipment Manufacturers' Association; National Association of Steel Furniture Manufacturers.

Cincinnati: National Association of Iron and Bronze Manufacturers; National Machine Tool Builders' Association.

President Campbell's Seventieth Birthday Celebrated at Cleveland

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown, Ohio, was 70 years of age Sept. 11 and the anniversary was celebrated with a birthday dinner given in Cleveland by Samuel Mather and H. G. Dalton of Pickands, Mather & Co. This was attended by a number of Mr. Campbell's associates in Youngstown and by other prominent executives in the iron and steel industry, 30 in number, and all close personal friends of Mr. Campbell. Formalities were avoided and it was a most agreeable party of associates.

The afternoon was spent at golf at the Mayfield Country Club, after which all went to the Roadside Club, where the dinner was served. Samuel Mather presided and the speakers were Charles M. Schwab, chairman Bethlehem Steel Corporation; Robert Hobson, president Steel Co. of Canada, and L. A. Manchester, general counsel Youngstown Sheet & Tube Co., the latter responding for the company. All the speakers paid tribute to Mr. Campbell and Mr. Schwab's address was commented on in particular, being declared by some of the guests the best speech he ever made.

Mr. Campbell was presented a beautifully bound book signed by all the guests present. In his response to the expressions of good will which were voiced, Mr. Campbell referred to a testimonial letter from the 36 representatives of employees, elected by the workers themselves. Letters of congratulation and expressing sincere regret because of their inability to be present were read from Judge E. H. Gary and President James A. Farrell, United States Steel Corporation; John A. Topping, chairman Republic Iron & Steel Co.; A. C. Dinkey, president Midvale Co., and Willis L. King, vice-president Jones & Laughlin Steel Corporation, and others.

Among those in attendance, in addition to the steel men named above, were E. G. Grace, president Bethlehem Steel Co.; T. J. Bray, president Republic Iron & Steel Co.; Severn P. Ker, president Sharon Steel Hoop Co.; Jonathan Warner, president Trumbull Steel Co.;

E. A. S. Clarke, secretary of American Iron and Steel Institute; C. P. Wheeler, Pickands, Brown & Co., Chicago; C. S. Robinson, W. E. Reiley and Frank Purnell, vice-presidents, and John Stambaugh, John L. Severance, Richard Garlick, E. L. Ford and A. E. Adams, directors of the Youngstown Sheet & Tube Co., and William G. Mather, Elten Hoyt II and John C. Chandler, Cleveland.

Mr. Campbell was born in Ohltown, Trumbull County, Ohio, and attended Hiram College. His first employment in the steel industry was in 1891-94 with the Trumbull Iron Co., Warren, Ohio, as general superintendent. He was made general superintendent when this plant was consolidated with the Union Iron & Steel Co. In 1897 he became general superintendent of the Mahoning Valley Iron Co. and in 1899 became Youngstown district manager of the Republic Iron & Steel Co. In 1901, with the late Col. George D. Wick and others, he organized the Youngstown Iron Sheet & Tube Co. to make iron sheets and pipe accessories. The word iron was later dropped from the company's name. He was vice-president and general manager of the company until 1903, when he was elected president and is still the active head of the third largest steel company in the country.

Portland Cement Production in August

Figures of the Geological Survey show a record-breaking production and record-breaking shipments of Portland cement in August. Production was 15,128,000 bbl., an increase of nearly 8 per cent on the previous record of 14,029,000 bbl., made in July. Shipments are given as 16,855,000 bbl., an increase of 1½ per cent on the previous record of 16,614,000 bbl., also made in July. Stocks at the end of August are given as 10,583,000 bbl., the lowest figure since the end of November last.

Production for the first eight months of the year has amounted to 95,944,000 bbl., compared with 88,318,000 bbl. for the first eight months of 1923. Each of these in turn has been a new high record. Shipments for the first eight months of this year were 95,965,000 bbl., or very close to the figure for production.

GERMAN COAL MINES INACTIVE

London Conference and German Industry—Important Engineering Merger—More Unemployment

BERLIN, GERMANY, Aug. 13.—The favorable development of the international political situation, the great possibility of satisfactory results of the London conference and of a large credit for German industry, have created a more hopeful tone. In several industries large firms already have been able to obtain extensive foreign credits and a greater optimism prevails in financial quarters. At present conditions in the industry, however, still are depressed.

In the Ruhr coal industry, for instance, about 40,000 miners are out of work. Demand has become small and as stocks already are too large, the number of shifts worked had also to be further reduced. A number of mines in the Southern Ruhr district have been closed and 16 more are to stop production shortly. In the Aachen district the greatest part of the production has to be stored, on account of the small sales. At the Lower Silesian mines two shifts less per week are worked and most of the single mines in other districts have been closed. In the Central German lignite industry on the average three shifts per week are worked. The mines near Düren have been closed and at the Westerwald mines half of the men have been dismissed. The ore mines also are employing only about one-third of their normal number of men. As there are no prospects of an improvement in the industrial situation during August a continued depression in the coal industry is reckoned with.

The iron and engineering industry is further reducing production and the general public is holding back on purchases in the expectation of lower prices later on. As the mines and the wholesalers have huge stocks there is no fear of a scarcity this year. The question of a price reduction is already under consideration at the Syndicate. Upper Silesian and British coal also are competing successfully with the Ruhr coal, even close to its own district. British coal has gained a strong footing even at the Middle Rhein and in South Germany, where the cheap transport along the Rhein via Rotterdam gives them an advantage. Industrial firms in these districts have sustained considerable losses during the last few years, owing to the irregular supplies from the Ruhr, and have now to a great extent made contracts for British coal to make sure of uninterrupted supplies.

Unemployment Increasing

At the Thyssen engineering works the working hours have been fixed at 30 per week. The Thyssen tube works are fully employed but production at the sheet mills had to be reduced.

Employment in the Solinger and Remscheid hardware industry is decreasing. The number of home orders has become small and even the orders of larger customers, especially the railroads, are diminishing. Export orders also have fallen off and even the best employed firms have been forced to work only three or four days per week. Many firms have given notice of a reduction of output and an increase in the number of unemployed has to be expected. The tool industry has few orders on the books and the turnover is small. On the average the industry is working only three to four days per week.

Scrap traders expect a considerable improvement in the market after the London conference has come to a satisfactory settlement of the various questions, and prices show an upward tendency. The turnover, however, is still small, as the works are holding back with orders. The Central German and Upper Silesian works have given notice of the termination of their contract with the Schrotteinkaufs Gesellschaft, Berlin (Scrap Purchasing Co.), on Dec. 31, but it is expected that the agreements will be prolonged or new ones be made. In the occupied area, which uses more than 60 per cent of the entire German scrap consumption, the iron works

individually are buying their scrap in the market. There are, however, indications that a closer cooperation in the matter of scrap purchases will take place. The firms of Krupp, Rheinstahl and Mannesmann already have made an agreement with a group of scrap wholesale traders, consisting of the firms Stern, Cosmann, Rapo & Grünwald and Kaufmann, that the entire scrap requirements of the three iron firms is to be supplied by the trading firms.

Upper Silesia in the Doldrums

The German Upper Silesian iron industry has not yet recuperated from the blow it received from the long strike. Polish Upper Silesia, its best customer for pig iron, is passing through a severe industrial crisis and has reduced production and, as sales to other parts of Germany are also insufficient, the iron masters had to blow out several blast furnaces and only six are active of a total of fifteen. The market in rolled material also is slack and output has been reduced. Employers were of the opinion that a strong reduction of wages which would bring down prices would also stimulate sales and they gave notice of the termination of the wage agreement and demanded a 20 per cent decrease in the rate. The Ministry of Labor, however, has stipulated only 5 per cent reduction. The iron masters have accepted this and have consequently withdrawn the notices they had given to their employees.

Owing to the economic crisis and the more strict application of the regulations in regard to official business supervision, the number of bankruptcies in this country has increased remarkably. During July business supervision was revoked in 412 cases and most of the firms had to declare their insolvency. New supervisions were applied with more discrimination and the number reached only 501 in July, compared with 833 and 623 during June and May respectively, while the number of insolvencies went up to 1173, which is the highest ever recorded during a single month. Even before 1914 there never had been more than 1000 per month during an economic crisis. During the entire first quarter of this year only 140 cases of insolvencies occurred, with 133, 322 and 579 cases during April, May and June respectively.

An important merger in the engineering industry has taken place between Heinrich Lanz, Mannheim, and R. Wolf, Magdeburg, two of the leading firms in the locomobile and agricultural machinery line. Through this merger the new concern has almost a monopoly of the German manufacture of agricultural machines. With the improvement in the economic conditions of Russia, which has been one of the principal customers of the two firms, a keen competition would have set in which is now averted through their linking up.

More Building Volume in August

Reports of F. W. Dodge Corporation show building contracts in August amounting to \$354,442,700, or 3 per cent more than the July figure and 19 per cent more than in August of last year. The figures cover the 36 Eastern States and represent about seven-eighths of the total building construction of the United States. Residential buildings, as for some months, led with \$148,231,800, or 42 per cent of the total. Industrial buildings were at the relatively low figure of \$30,379,800, or 8½ per cent of the total.

For the first eight months of the year the construction contracts awarded amounted to \$3,020,761,400, an increase of 11 per cent over the corresponding period of last year. This increase has been largely in the States in the East and Southeast, for the territory west of the Allegheny Mountains and north of Tennessee has been somewhat less active in building than it was last year.

Germany's exports in the first half of 1924 were 2,827,279,000 gold marks, including 2,315,137,000 marks of manufactured goods. Of 4,484,640,000 marks imports, 2,004,495,000 marks were raw materials and 1,033,705,000 marks food and drink.

Sheet Steel Simplification Recommended

WASHINGTON, Sept. 16.—Reduction from 1819 items to 261 in gages and weights of sheet steel will be proposed on Oct. 14 at a joint meeting of the American Hardware Manufacturers Association and the National Hardware Association of the United States. Announcement to this effect was made today by the division of simplified practice of the Department of Commerce. The program to be presented constitutes the work of the simplification committee of the sheet steel industry, the result of a meeting of the metals branch of the National Hardware Association in Cleveland on May 25, 1923. Surveys of the output were made in 26 mills by the committee, headed by Walter C. Carroll, vice-president Inland Steel Co., Chicago. Twenty-three of the mills have indicated their approval of the program outlined, which will go before the Atlantic City meeting for action by the hardware group on the 86.6 per cent reduction.

The simplification committee of the terne plate industry, headed by H. N. Taylor of N. & G. Taylor Co., Philadelphia, is expected to make a tentative report recommending tentative elimination of 10 per cent in weights of terne plate. Further reports are also expected from the simplification committee working on eaves trough and conductor pipe, this committee being headed by A. Q. Moffat of Wheeling, W. Va., the programs having been affected by the work of the sheet steel committee. A. E. Foote, of the division of simplified practice of the Department of Commerce, has directed the cooperative work of the division in the surveys of these three groups and will be present at the joint meeting.

Increasing Operations of the British Empire Steel Corporation

TORONTO, Sept. 15.—The various departments of the plant of the British Empire Steel Corporation, Sydney, N. S., which closed down Aug. 8, are beginning to show signs of renewed activity. Already the corporation has one furnace in blast, has reopened its bar mill, rod, wire and nail mills, and it is expected that other departments will resume operations in the not distant future. According to a statement recently made by Roy M. Wolvin, president of the corporation, substantial new business is in prospect and orders on this account are expected to be booked within a few weeks. The principal departments of the corporation showed a considerable increase in production during the first seven months of this year, as compared with production for the corresponding period of 1923. Production for the seven months ending with July shows pig iron at 159,457 gross tons, compared with 140,567 tons in the same period of 1923; while the output of ingots totaled 171,803 tons for the seven months of 1924, compared with 160,925 tons in the corresponding period of the previous year. The total production of pig iron by the corporation during 1923 amounted to 277,081 tons, and of ingots 287,988 tons.

Iron and steel interests of this country are of the opinion that large contracts for steel rails will be awarded in the not distant future for winter rolling, and with the placing of this business activities at the Sydney, N. S., works and the mills at Sault Ste. Marie, Ont., will be resumed, which will also have a direct bearing on the various other departments at these works.

Iron Ores and Iron Industry of China

Under the above heading, the Geological Survey of China has issued Volume II of its series in a book of 457 pages of type, 39 plates, and a considerable appendix in Chinese characters. The work is divided into three parts devoted respectively to the iron ore deposits of China, covering 292 pages, the iron industry of China, covering 104 pages, and a summary of the iron situation in the circum-Pacific region.

Particularly interesting is the section devoted to the iron industry of China, which starts with a historical sketch dating from 2205 B. C. and brings the

reader up to the present day. Modern conditions are covered by districts, with descriptions of the most important of the operating plants (see THE IRON AGE, Aug. 23 and 30 and Sept. 6, 1923, for detailed descriptions and illustrations of these plants).

Production of pig iron is given as about 900,000 tons maximum per annum, while the survey of consumption per capita gives China 1.4 kg. (3 lb.) per annum, compared with 250 kg. (550 lb.) in the United States, 130 kg. (287 lb.) in England and Germany, 85 kg. (187 lb.) in Sweden, 30 kg. (66 lb.) in Russia, 14 kg. (31 lb.) in Japan, etc. Actual production of pig iron never has reached anything like the 900,000 tons mentioned above, the highest figure in the table having been 276,587 tons in 1919. The figure for 1922 was no more than 163,672 tons. Imports in that year were 367,654 tons, while the exports of 211,091 tons were almost entirely of unmanufactured material. The balance available for consumption was 320,235 tons, this being the fourth largest tonnage for any year up to that time. The largest was in 1919, with 436,519 tons. Tabular matter covering imports and exports is quite complete.

In considering the iron situation of the circum-Pacific region, analysis is made of the production and consumption of all the countries in the eastern half of Asia, including British India, and extending thence to Australia and New Zealand. On the eastern side of the Pacific are considered Alaska, British Columbia, the Pacific Coast of the United States, Mexico and the West Coast of South America. In connection with the United States is given a map showing locations of blast furnaces and steel plants in Utah and states west of Utah, together with location of iron ore deposits, coking coal, etc.

Company Formed to Produce New Grate Bar

The Coplan Steel Corporation, Hull, Can., has been organized with \$250,000 in preferred stock and 7500 shares of common stock, to manufacture railroad steel castings, specializing in patented grate bars of heat-resisting qualities. These bars, said to endure five times as long as the ordinary bars, have been standardized on the Canadian National Railways. Several carloads have been supplied to American railroads.

Buildings are under construction, the main foundry to be 135 x 350 ft. and equipped with 3- to 10-ton traveling cranes. Work also is begun on a forging shop, 60 x 100 ft., a machine shop, 50 x 120 ft., pattern shop and storage plant. All are steel, cement and brick structures and are situated on a 59-acre tract which lies along the St. Lawrence River. The property is equipped with 1200 ft. of improved dockage. There are three New York Central sidings on the site. Equipment will include a 10-ton electric furnace and 3½-ton side-blowing converters. R. H. Coplan of the Hull Iron & Steel Foundries, Ltd., Hull, Que., is general manager.

Lake Iron Ore Shipments in August

Shipments of iron ore from the Lake Superior region in August were larger than those in August, 1922. This year they were 10,296,133 gross tons, which compares with 9,016,426 tons in August, 1922. This increase over last year was therefore 1,279,707 tons or 14.19 per cent. The totals by ports, with season shipments and a comparison with 1922, are given below:

	August, 1924	August, 1923	To Sept. 1, 1924	To Sept. 1, 1923
Escanaba	597,819	875,772	2,339,881	3,995,467
Marquette	348,357	442,370	1,458,001	1,778,343
Ashland	627,632	1,081,635	3,304,820	4,149,251
Superior	2,207,256	3,358,678	9,579,365	11,007,258
Duluth	2,193,014	3,498,358	8,806,549	11,823,332
Two Harbors...	715,489	1,038,993	3,308,093	4,138,885
Total	6,689,567	10,295,806	28,796,709	36,892,536
Decrease	3,606,239	8,095,827

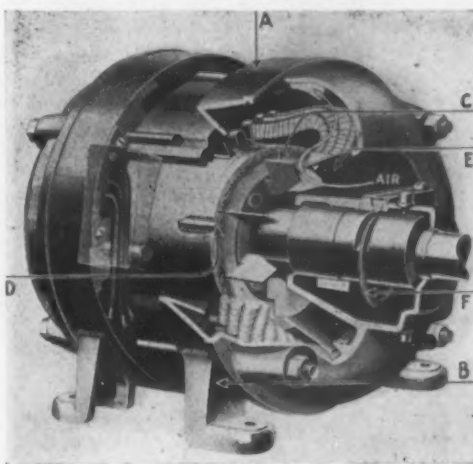
The decrease in season shipments to Sept. 1, 1924, has been 8,095,827 tons or 21.94 per cent as compared with an increase for the same period a year ago of 10,582,925 tons or 40.22 per cent.

Welding Employed in Construction of Electric Motors

Improvement in design and reduced manufacturing costs are claimed in connection with the use of arc welding in the construction of the electric motor illustrated, which is being marketed by the Lincoln Electric Co., Cleveland.

The end frame *A* is made by rolling a standard steel angle to circular shape, then joining the ends with the arc welder. The feet, *B*, are drop forgings welded to the angle steel frame and the blowers, *C*, for ventilation are welded to the rotor or armature by arc welding. The copper rods or windings of the rotor, *D*, are welded to the short circuiting rings, preventing loosening or current leakage at this point.

The use of steel in the place of castings is said to



Showing Various Parts of a Motor Which Now Are Welded in Assembling

provide parts that cost less and at the same time are stronger. The end frame being rolled from a standard steel angle is of much thinner section than the casting formerly required, providing more ventilating space between frame and coils and making for better cooling. The steel frame can be hot riveted and be drawn up tighter without breakage, thus holding the stator laminations more firmly and producing a better electrical field.

Lackawanna's New Mill

BUFFALO, Sept. 16.—Ground has been broken at the Lackawanna plant of the Bethlehem Steel Co. for a new structural mill as part of the company's expansion project. This will be a 28-in. and 35-in. mill and will cost approximately \$800,000. Plans are being drawn for the construction of another shape mill rolling 14-in. and 18-in. shapes. The Westinghouse Electric & Mfg. Co. has the contract to electrify the mill under course of construction.

After being buried underground for about eight years a motor in California was recently dug up and with a little overhauling was found to be in excellent condition. A General Electric, Sprague type S, 6-pole 40-hp. 2200-volt vertical motor was installed in a well on a ranch at Corona, Cal. In 1916 the well caved in and buried the motor. Recently the motor was removed from the well, was cleaned up, thoroughly dried, and tested with 440 volts to ground and the insulation found to be good. The oil piping to the lower bearing had rusted out and was replaced. The two babbitt bearings were in good condition, but the upper ball bearing, being badly rusted, had to be replaced. The motor was repainted and is now ready for further operation.

Pan-American Standardization Conference

WASHINGTON, Sept. 16.—Standardization of specifications and uniform nomenclature of raw materials, supplies, tools, machinery, equipment and other merchandise will be considered on Dec. 23 at Lima, Peru, when the first Pan-American standardization conference meets. According to an announcement made by the Pan-American Union, it is expected that at the first conference special attention will be devoted to the standardization of crops and raw products. Inasmuch as these are the principal commodities of the Latin-American republics, standardization will enable these products the more easily and profitably to enter their natural markets. Terminology, it is thought, might take a place of second importance for immediate action, preceding the adoption of mechanical standards.

Mining Engineers to Meet in South

BIRMINGHAM, ALA., Sept. 16.—Program for the 130th meeting of the American Institute of Mining and Metallurgical Engineers, to be held in Birmingham, Oct. 13, 14 and 15, has been completed by James L. Davidson, secretary of the Alabama Mining Institute, working with a committee of the institute. Interesting papers will be presented and discussed, local men to participate. While in the Birmingham district the engineers will be shown ore and coal mining projects, cast iron pipe and Portland cement production, steel and iron making plants, the Southern method of mining and smelting and other operations. Special trains, automobiles and other conveyances are to be provided to transfer the engineers through the district. From Birmingham the delegation will go to Muscle Shoals, in the northwestern part of Alabama on the Tennessee River, where the great Wilson dam and hydroelectric plant is located, the Government project which has been in the public mind for the past several years.

Increase in By-Product Coke Production

WASHINGTON, Sept. 16.—Showing an increase of 58,000 tons or 2.4 per cent over the revised figure for July, production of by-product coke in August is estimated at 2,425,000 tons, according to the Geological Survey. The improvement, it is stated, appears to have been due to increased activity of the iron and steel industry. The present rate of output of by-product coke is now 22 per cent less than the average monthly rate in 1923 and about 5 per cent less than that of 1920. The August output represented 64.1 per cent of capacity, and an average daily production of 78,237 tons. One new plant reported in August, bringing the total number of reporting plants up to 74, of which 68 were active. Of the total output, 79.3 per cent was produced at plants affiliated with companies engaged also in the manufacture of iron and steel. There was no improvement at the beehive ovens and production declined to 434,000 tons, a decrease of 7 per cent. The present monthly rate of output is less even than the average of 1921, and is barely a quarter more than the average weekly rate last year.

Over 200 employees of the Youngstown Sheet & Tube Co. have purchased homes built and sold by the company on a very reasonable deferred payment basis. The company's housing is handled by a subsidiary organization, the Buckeye Land Co. Interest on unpaid balances is charged at the nominal rate of 5 per cent., as compared with a current bank or building and loan association rate of 7 per cent. On its Loveland Farms plot, the company has developed a carefully restricted, high-grade residence community, where 140 employees now own their homes.

The members of the Electric Hoist Manufacturers' Association report a decrease of 18.14 per cent in the number of hoists sold in August as compared with July, and a decrease of 20.14 in the value of hoists ordered. Shipments decreased 42.65 per cent as compared with shipments made in July.

Apprenticeship Plan to Be Introduced in Quad Cities

A comprehensive plan for the training of apprentices is about to be introduced in the foundries of the Quad Cities, comprising Moline, East Moline and Rock Island, Ill., and Davenport, Iowa, according to remarks made before the Chicago Foundrymen's Club Sept. 8, by A. E. Hageboeck, secretary Frank Foundries Corporation, Moline, and past president Quad City Foundrymen's Association. That organization's apprenticeship committee, of which Fred Kirby, superintendent Marseilles plant, Deere & Co., is chairman, has developed a program whereby it is proposed to handle apprentice training under a group plan. This includes an apprenticeship supervisor, who is to have charge of the apprentices in all of the foundries going into the proposition. It is planned to have uniform rates and a uniform method of instruction, including four hours a week of continuation school and two hours a week of personal instruction by different plant representatives. The expense of this program is to be allocated among the foundries participating, on the basis of the average number of molders and core makers employed. Practically enough signatures have been obtained from the plants in the Quad City district to insure the inauguration of the plan this fall.

The apprenticeship plan, Mr. Hageboeck said, was one of the results of the association's consistent efforts to do constructive work in educating the foundrymen in their practical problems. In reviewing some of the features of the organization's programs during its first two years of existence, he stated that none had proved of more general interest than the meeting at which Eugene W. Smith, Crane Co., Chicago, and president of the Chicago Foundrymen's Club, delivered an address on the subject of molding sand. Mr. Hageboeck stated that Mr. Smith's vibratory method of making sand analyses had been found very helpful by many of the association's members; in fact, several are making daily tests and keeping a daily record according to it.

New Sintering Plant at South Chicago

The American Ore Reclamation Co. has issued a license for the Dwight & Lloyd sintering process to the By-Products Coke Corporation, Chicago, and a sintering plant will be installed at the Federal furnace plant of the By-Products Coke Corporation at South Chicago. It will have a daily capacity of 250 tons of sinter from blast furnace flue dust. The American Ore Reclamation Co. will design and construct the plant, which is expected to be in operation early in 1925.

Losses and Gains in Mill Operations in Youngstown District

YOUNGSTOWN, Sept. 16.—Somewhat more difficulty was encountered by managers of district steel properties in maintaining an average production rate of 75 per cent in finishing departments for the current week. However, losses in active merchant steel bar and sheet capacity were offset to some degree by gains in tin and plate mill schedules.

Early expansion in active iron capacity is indicated by plans of several interests for blast furnace resummptions. Within several weeks the Youngstown Sheet & Tube Co. expects to blow in the last idle stack in its East Youngstown group. The A. M. Byers Co., Pittsburgh, will start its Mattie stack at Girard upon completion of repairs now under way. The Struthers Furnace Co., operating a merchant stack at Struthers, Mahoning county, is inquiring for coke for its furnace. The Carnegie Steel Co. plans to start another stack in its Farrell, Pa., group at an early date.

These projected resummptions will increase the number of active blast furnaces in the Youngstown district from 18 to 22 of 45.

This week 37 of 52 independent open-hearth furnaces are melting in the Mahoning Valley, and 22 of the 30 Steel Corporation open hearths in the district. Of 120 sheet mills 80 are scheduled by the independents;

12 of 17 tube mills and 29 of 38 independent tin mills.

Following an idleness of many months, the Liberty works at Leavittsburg in Trumbull county of the Trumbull Steel Co. started Sunday midnight with six of the ten mills engaged.

Offsetting to some extent the loss of three bar mills and one skelp mill by the Republic Iron & Steel Co. is the operation of its merchant plate mill. Both the 9-in. and 12-in. bar mills of the Sheet & Tube company were to be inactive the first part of the week.

Eight sheet mills in the group at Mercer, Pa., of the American Sheet & Tin Plate Co. and four mills at Niles of the Waddell Steel Co. are again active.

U. S. Steel Orders Increase

Unfilled business on the books of the United States Steel Corporation as of Aug. 31 aggregated 3,289,577 tons, or 102,505 tons more than remained unfilled on July 31. In July the unfilled business decreased 75,433 tons, in June 365,584 tons, in May 580,358 tons, in April 574,360 tons, and in March 130,094 tons, while in February it increased 114,472 tons, and in January 353,090 tons. A year ago the unfilled business was 5,414,663 tons, or 2,125,086 tons more than on Aug. 31 last. Following is the unfilled tonnage reported by months beginning with January, 1922.

	1924	1923	1922
Jan. 31.....	4,798,429	6,910,776	4,241,678
Feb. 29.....	4,912,901	7,283,989	4,141,069
March 31.....	4,782,807	7,403,332	4,494,148
April 30.....	4,208,447	7,288,509	5,096,913
May 31.....	3,628,089	6,981,351	5,254,228
June 30.....	3,262,505	6,386,261	5,635,531
July 31.....	3,187,072	5,910,763	5,776,161
Aug. 31.....	3,289,577	5,414,663	5,950,105
Sept. 30.....		5,035,750	6,691,607
Oct. 31.....		4,672,825	6,902,287
Nov. 30.....		4,368,584	6,840,242
Dec. 31.....		4,445,339	6,745,703

Wages of Sheet and Tin Mill Workers Reduced

Tonnage rates paid sheet and tin mill workers in mid-western mills subscribing to the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers are reduced 3 per cent for the September-October period, from the rate paid the two preceding months. Under the new rate, such workers will be paid 40½ per cent above base.

The reduction followed the examination of sales sheets for the 60 days' ended Aug. 31. Average price of Nos. 26, 27 and 28 gage black sheets shipped during the period named was disclosed as \$3.50 per 100 lb., as compared with \$3.60 two months before.

While the volume of tonnage shipped by subscribing interests during the past two months was only fair, nevertheless the settlement shows that prices have been well sustained on bulk of the tonnage shipped.

The settlement was conducted Sept. 11 at Youngstown. James H. Nutt, secretary of the Western Sheet and Tin Plate Manufacturers Association, represented the employers and M. F. Tighe of Pittsburgh, president of the Amalgamated association, the workers.

Atlas Steel Corporation to Be Sold

Under an order of the district court of the Northern district of Ohio, based on a final judgment in the United States district court of the Western district of New York, all of the real estate, buildings, equipment and other assets of the Atlas Steel Corporation, with principal headquarters at Dunkirk, N. Y., will be sold at receiver's sale Oct. 1, at Mayville, Chautauqua county, N. Y. This is the final action in settlement of the company's affairs, and follows litigation in the upper and lower courts.

The company owns a tract of land in Trumbull county, Ohio, in addition to its other holdings. Harry E. Nichols of Dunkirk and J. D. Waddell of Niles, Ohio are ancillary receivers for the company.

The Atlas Steel Corporation was a consolidation of the old Atlas Crucible Steel Co., Dunkirk, and the Electric Alloy Steel Co., Youngstown, Ohio. It was headed by L. J. Campbell, of Youngstown.

Wire Drawing and Properties of the Steel

Changes Due to Progressive Drawing Traced by Photomicrographic Analysis—Study of the Grain Size

BY GEORGE F. COMSTOCK*

[In the first half of this article, THE IRON AGE, Sept. 11, the author discussed the physical properties of the steel as affected by progressive cold drawing.]

LENGTHWISE sections of most of the wires were examined under the microscope. The non-metallic inclusions in them were studied and the grain-size was measured in those sizes which were not too much distorted to allow the grain boundaries to be distinguished. Neither Heat F nor the first lot of Heat A was included in this work, but a second lot of Heat C was studied although not tested in tension.

The notes recorded on the inclusions found in the various sized wires from each lot may be summarized as follows:

Heat and Lot	Sulphides	Alumina	Slag and Oxide
A—2nd	Variable	Little	Hardly any
A—3rd	Variable	None	Little
B—...	Small	Little	Little
C—1st	Small	Considerable	Very little
C—2nd	Small	Considerable	Very little
D—...	Small	Little	Considerable
E—...	Small	None	Little

*Metallurgical engineer, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

The inclusions were hardly prominent enough in any of these samples to have had an important effect on the tensile test results. It may be significant, however, that Heat D, for which the reduction of area curve was especially irregular, was one of the two dirtiest heats examined, the other being Heat C, in which the typical inclusions were alumina instead of slag. Some photomicrographs, all taken at a magnification of 200 dia., are submitted herewith to illustrate the inclusions in the hot-rolled rods as well as after 91 per cent reduction in area by cold drawing. The alumina in Heats A and C was not affected by the cold work, while the sulphides in Heat A, and the silicates or slag in Heat D were decidedly elongated and broken up.

The polished sections of the rods and wires were etched with nitric acid to develop their structures, which are illustrated by photomicrographs, all taken at 200 dia. The rods from the seven lots examined showed slight differences in structure, as noted in the table below, but the structures of the drawn wires of any given size did not vary appreciably between the

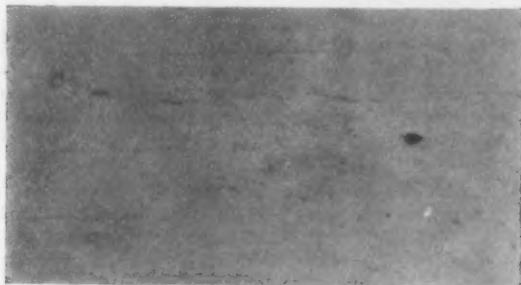


Fig. 1—Small Gray Sulphide Inclusions and a Black Particle of Alumina in a Lengthwise Section of Rod Heat A, Second Lot, Unetched, Magnified 200 Dia.

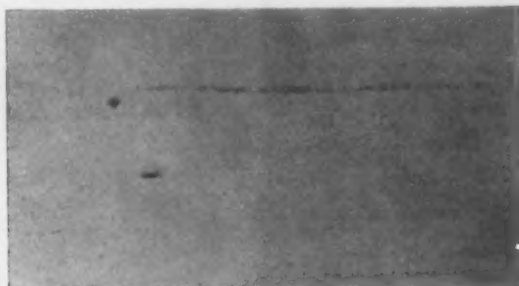


Fig. 2—Same as Fig. 1, Except That This Sample Was a Wire Reduced by Cold-Drawing 91 Per Cent in Cross-Sectional Area

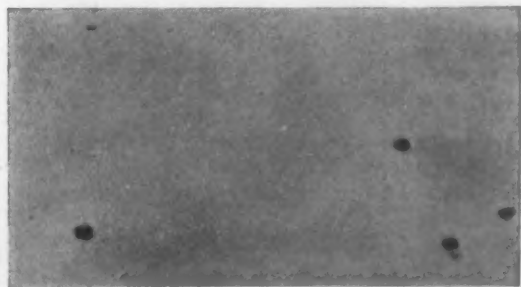


Fig. 3—Alumina Inclusions in a Lengthwise Section of Rod from Heat C, First Lot, Unetched and Magnified 200 Dia.

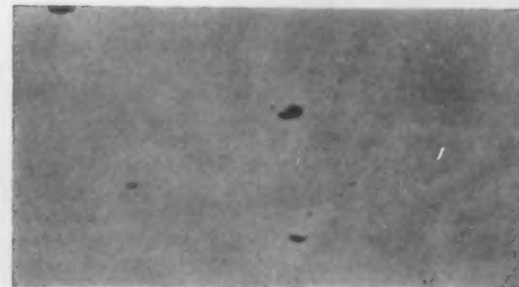


Fig. 4—Same as Fig. 3, Except That This Sample Was a Wire Reduced by Cold-Drawing 91 Per Cent in Cross-Sectional Area



Fig. 5—Slag or Silicate Inclusions in a Lengthwise Section of Rod from Heat D, Unetched and Magnified 200 Dia.

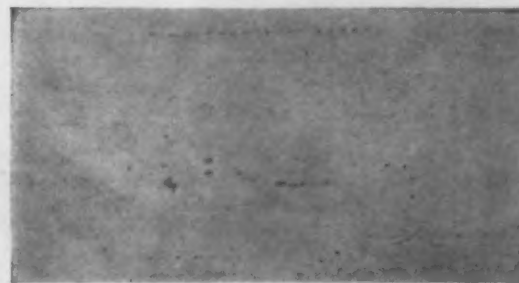


Fig. 6—Same as Fig. 5, Except That This Sample Was a Wire Reduced by Cold-Drawing 91 Per Cent in Cross-Sectional Area

In reproducing the photomicrographs in this article, they were reduced about one-third in size

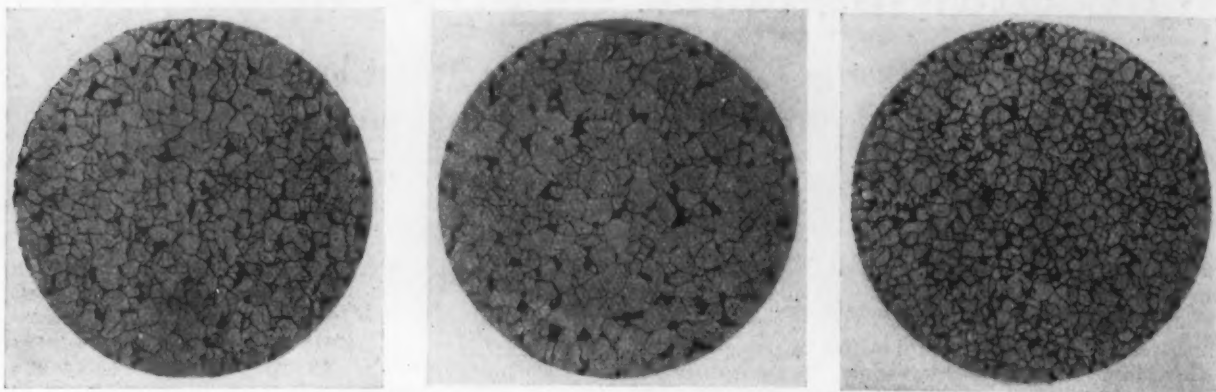


Fig. 7—Typical Fairly Uniform Structure of Rod from Heat A, Second Lot, Etched with Nitric Acid and Magnified 200 Dia.
 Fig. 8—Rather Coarse Structure of Rod from Heat A, Third Lot, Etched and Magnified Like Fig. 7
 Fig. 9—Rather Fine Structure of Rod from Heat D, Etched and Magnified Like Fig. 7

different lots. The structure of each wire in the second series of Heat A, from the hot-rolled rod to the wire reduced 94 per cent in area by cold drawing, is illustrated by a photomicrograph, which may be taken as typical of similar wires from all the heats.

Grain-size measurements by Jeffries' method (see A. S. T. M. Standards, 1921, p. 856) were attempted at a magnification of 400 dia. on all the rods and wires, but it was found possible to count the grains only in those reduced less than 70 per cent in area. The grain boundaries were not distinct enough to permit this measurement in the finer wire and even in many of those reduced about 67 per cent the count was rather doubtful. The measurements were made in duplicate by two observers, and the average of each pair of results is tabulated below, together with a few notes on the structures of the rods.

Heat and Lot	Pearlite Distribution	De-carbonization at Edges	Rod	Number of Grains per Sq. Mm.	
				46 Per Cent Reduction	67 Per Cent Reduction
A—2nd	Fair	None	5,250	3,650	3,300
A—3rd	Fair	Considerable	3,950	4,050	3,750
B	Fair	Slight	5,450	4,550	3,500
C—1st	Good	Very slight	5,200	3,950	3,150
C—2nd	Good	Excessive	4,950	3,600	3,150
D	Fair	Slight	5,850	3,200	3,350
E	Poor	Slight	4,600	3,350	3,600
Average			5,030	3,760	3,400
Theoretical				3,840	3,000

It will be noted from the above table that Heat E, which gave the only tensile strength curve without any suggestion of a horizontal portion, was the only one whose rod showed a poor structure. Possibly there may be a connection between those two facts. Several discrepancies may be noted in the tabulated grain-size measurements, but the averages are not far from the

theoretical figures given at the bottom of the table. The sample examined from the rod of Heat A, third lot, had probably been coarsened locally in some way as compared with the parts of the rod actually used in drawing the wires. The discrepancies in the last column may be ascribed in part to errors in judging the grain boundaries, although the individual counts by the two observers agreed quite well in each case.

The method used in working out the theoretical values for the number of grains per square millimeter in the drawn wires should perhaps be explained. These values were derived from the average value of 5030 grains per sq. mm. for the rods, and the average diameters of the rods (0.21 in.) and of the wires (0.16 in. and 0.25 in. respectively). It must also be remembered, of course, that all the grain counts were made on lengthwise sections. To work out this problem in a general way, let "A" be the original diameter of the rod, and "B" be the final diameter of the wire. Let "C" be the number of grains cut by one diameter of the rod, which is assumed to have equiaxed grains (this condition is shown by the photomicrographs of the rods used in this work). Assume also a unit length for the original rod, that is, take a length equal to 1. The area of the rod's section is $\pi A^2/4$, which expression also gives the volume of the assumed unit length. Let us assume no change in volume when the wire is drawn, which is very nearly true. The final volume of the drawn wire is its length multiplied by its cross-sectional area, $\frac{\pi B^2}{4}$. Then $\frac{\pi A^2}{4} = \frac{\pi B^2}{4} \times \text{length of wire}$, or the length of wire = $\frac{A^2}{B^2}$.

Assuming that the grains are elongated in drawing symmetrically with the wire or, in other words, that

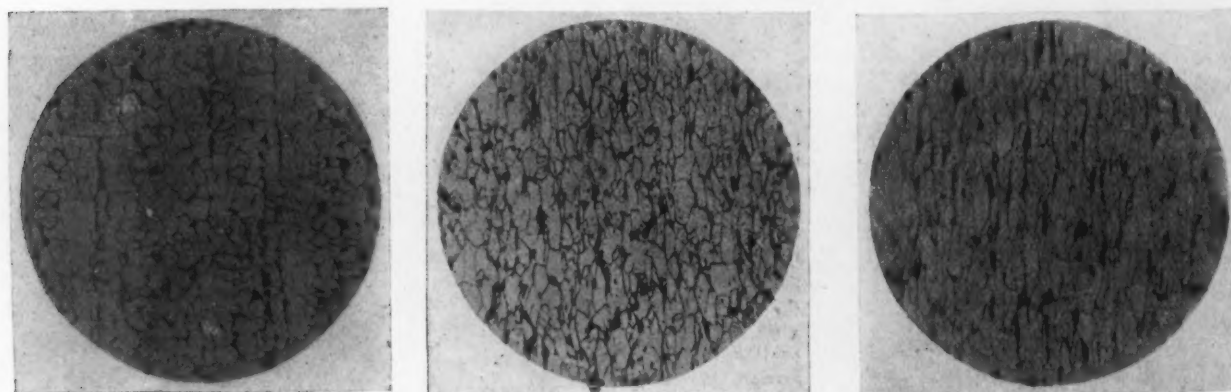


Fig. 10—Slightly Streaky Structure of Rod from Heat E, Etched and Magnified Like Fig. 7
 Fig. 11—Typical Structure of Wire from Heat A, Second Lot, Drawn to Cross-Sectional Area of 0.2 Sq. In. (46 Per Cent Reduction), Etched with Nitric Acid and Magnified 200 Dia.
 Fig. 12—Same as Fig. 11, but Drawn to 0.127 Sq. In. Cross-Sectional Area

each grain is elongated just as much as the whole wire, the number of grains in the full length of the wire would be the same as the number in the unit length of the rod, which is C/A , since the rod is equiaxed. Then the number of grains per unit length of wire is $\frac{C}{A}$ divided by $\frac{A^2}{B^2}$, or $\frac{CB^2}{A^3}$. Since the grains are assumed to be distorted symmetrically with the wire, the number of grains cut by one diameter of the wire is the same as in the rod, or C , and the number of grains per unit thickness of the wire is $\frac{C}{B}$. Therefore the number of grains per unit area of a lengthwise section of the wire is $\frac{CB^2}{A^3} \times \frac{C}{B}$, or $\frac{C^2B}{A^3}$. This may be written $\frac{C^2}{A^2} \times \frac{B}{A}$. Now $\frac{C^2}{A^2}$ is the number of grains per unit area of section of the original equiaxed rod. Hence, the number of grains per unit area of lengthwise section of the wire equals the number of grains per unit sectional area of the rod multiplied

determinations on the more severely drawn wires, or to distinguish between the structures of such wires from the different heats, no light was thrown by the microscopic work on the peculiarities of the tensile-strength curves that have been discussed above.

In conclusion it may be stated that although this work has shown that at least some steel rods, when drawn into wires of decreasing diameters, do not increase regularly in tensile strength, the actual cause of the irregularity was not determined. At about 80 to 90 per cent reduction of area by cold drawing, a point was reached in most of the samples where further drawing did not cause much increase in strength until a certain amount of work was exceeded, when still more cold drawing caused a more rapid increase in strength than before. Microscopic examination of the wires did not explain this phenomenon, but a study of the grain-size of the less severely drawn wires was rather interesting for other reasons.

The author would acknowledge the skillful assistance of A. B. Wilson in the metallographic work, and

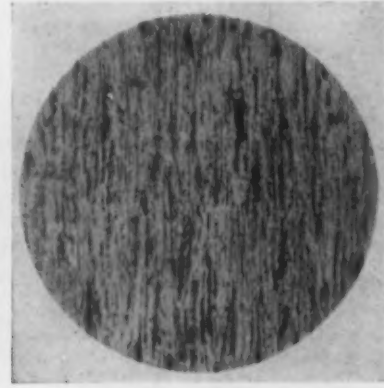
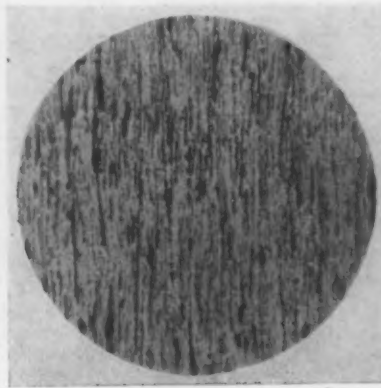
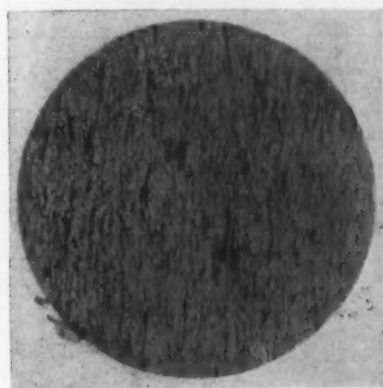
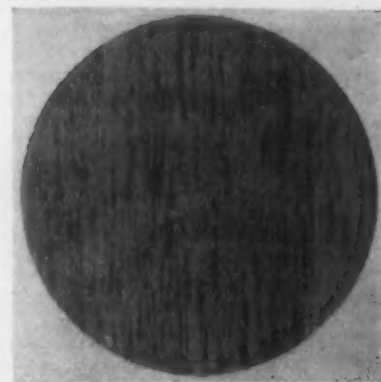


Fig. 13—Same as Fig. 11, but Drawn to 0.080 Sq. In. Cross-Sectional Area

Fig. 14—Same as Fig. 11, but Drawn to 0.047 Sq. In. Cross-Sectional Area

Fig. 15—Same as Fig. 11, but Drawn to 0.033 Sq. In. Cross-Sectional Area

Fig. 16—Same as Fig. 11, but Drawn to 0.023 Sq. In. Cross-Sectional Area



by the diameter of the wire and divided by the diameter of the rod.

The average and theoretical values for 46 per cent reduction are in satisfactory agreement, but at 67 per cent reduction the average actual values are high. Theoretical values computed separately for each lot are lower than the corresponding actual values except in two cases where there is good agreement. It may be that some of the grains were broken in the drawing, thus increasing the number counted; or, as seems more likely, there may have been some slipping of certain grains past others, so that they were not distorted to exactly the same extent as the entire wire. If this happened, one of the assumptions on which the above theory rests would be incorrect, and the theoretical value deduced would be too low, as it actually appears to be. Perhaps it was the slipping of the grains past each other that interfered with the sharp definition of the grain boundaries in the micro-sections of the wires reduced more than 67 per cent in cold drawing and thus made it impractical to count the grains of the more highly distorted specimens.

Since it was impossible to carry out the grain-size

also his indebtedness to the Titanium Alloy Mfg. Co. for permitting the use of the apparatus required for both the tensile and metallographic tests.

A course on labor and employment management for 15 sessions beginning Sept. 25 on Thursdays at 6 p. m. under the direction of J. D. Hackett, consultant in labor problems, is to be given by the department of business management of the School of Commerce, Accounts and Finance of New York University, Washington Square, New York. The sessions end at 7.45 p. m. and the fee for the course is \$20. For details as to the scope of the course application should be made to the department.

The American Steel & Wire Co. has advanced production to a 4-day week basis at its Anderson, Ind., works, replacing two days a week operating in a number of departments. It is expected that a 5-day week will become effective at an early date.

PAPERS ON ELECTROMETALLURGY

Program for Detroit Meeting of American Electrochemical Society

The annual fall meeting, designated the forty-sixth general meeting, of the American Electrochemical Society, is to be held in Detroit at the Hotel Tuller, Oct. 2, 3 and 4. A varied program of considerable commercial and technical interest has been prepared. Two sessions will be devoted to the subject of "Corrosion," contributions to which have been received from a wide area. Another session is to be devoted to the topic, "Industrial Electric Heating," in which field the automobile industry has made remarkable strides and in which Detroit is one of the most important centers. There are also to be sessions on "Refractories for Electric Furnaces" and on the "Physical Chemistry on Electrodeposition."

Two round-table discussions have been arranged, the one on "Electric Furnace Cast Iron," in charge of George K. Elliott, chief metallurgist Lunkeneimer Co., Cincinnati, and the other on "Controlled Methods in Electrodeposition," in charge of Prof. O. P. Watts of the University of Wisconsin and Dr. William Blum of the Bureau of Standards.

Alex Dow, well known throughout the country as a central station engineer, will address the members and guests of the convention on Friday evening, Oct. 3, on "Central Station Design and Superpower."

Among the social features will be a "get-together" fish, frog and chicken dinner at the famous Eastwood Inn, on Wednesday evening, Oct. 1, and a smoker at the

Hotel Tuller roof garden, Thursday evening, Oct. 2. The technical program for the various sessions is as follows:

Thursday, Oct. 1

- 9.30 a. m. Symposium on "Corrosion," Dr. B. D. Saklatwalla, chairman.
 "Film Protection as a Factor in Corrosion," by F. N. Speller.
 "The Micro-Chemistry of Corrosion," by Cecil H. Desch.
 "The Relation Between Tarnishing and Corrosion," by Ulick R. Evans.
 "The Influence of Emulsoids Upon the Rate of Solution of Iron," by J. Newton Friend, D. W. Hammond and G. W. Trobridge.
 "The Stainless Chromium Steels," by W. H. Hatfield.
 "Comments on Electrolytic Theory of Corrosion by Wilder D. Bancroft," by F. N. Speller and F. G. Harmon.
 12.30 p. m. Round-table discussion and luncheon, Hotel Tuller. "Electric Furnace Cast Iron," George K. Elliott, chairman.
 2 p. m. Symposium on "Corrosion" continued.
 "The Corrosion of Iron Alloys by Copper Sulphate Solution," by C. M. Kurtz and R. J. Zaumeyer.
 "The Effect of Cold Working on the Corrosion of Metals," by George P. Ryan.
 "Effect of Reduced Pressure on the Rate of Corrosion of Amalgamated Zinc in Acid and in Alkali Solutions," by E. W. Greene and O. P. Watts.
 "Tests for Grading Corrosion Resisting Alloys," by William E. Erickson and L. A. Kirst.
 "Insoluble Anodes for Brine. The Lead-Silver Series," by Colin G. Fink and Li Chi Pan.
 "Notes on Corrosion Testing by Different Immersion Methods," by H. S. Rawdon and A. I. Krynitsky.

Friday, Oct. 3

- 9 a. m. Symposium on "Industrial Electric Heating," Prof. C. F. Hirschfeld, chairman.
 "The Use of Electric Furnaces in Heat Treatment," by A. E. White.
 "Electric Furnace for Continuous Hardening and Tempering of Wire," by R. H. MacGillivray.
 "Annealing of Brass Tubing in the Electric Furnace," by Robert M. Keeney.
 "Electric Brass Melting," by F. S. Heath.
 "Electric Japanning," by Harry Allen.
 "Electric Furnace Refractories," Dr. M. L. Hartmann, chairman.
 "Thermal Conductivity of Carborundum Refractories," by M. L. Hartmann and O. B. Westment.
 "Preparation of Artificial Sillimanite," by C. E. Sims, H. Wilson and H. C. Fisher.
 "Fluorine in the Deoxidizing Slag and Its Influence on Refractories in Basic Electric Furnace Practice," by Frank T. Slisco.
 12.30 p. m. Round-table discussion at luncheon, Hotel Tuller. "Control Methods in Electrodeposition," in charge of O. P. Watts and William Blum.
 8 p. m. Board of Commerce Auditorium, Alex Dow, president Detroit Edison Co., will address the society upon "Central Station Design and Superpower."

Saturday, Oct. 4

- 9 a. m. "The Soederberg Electrode: Recent Commercial Installations," by M. Sem.
 "Influence of Sulphur, Copper, Oxygen and Manganese on the Red Shortness of Iron," by J. R. Cain.
 "Experiments on the Preparation of Very Pure Alloys and a Preliminary Study of Certain Electrical Properties of the System Al-Mg," by R. F. Mehl.
 "On the Preparation of Metallic Tungsten and Some of Its Alloys," by Louis Kahlenberg and H. H. Kahlenberg.

The Wheeling Steel Corporation has resumed operations in a large part of its Portsmouth, Ohio, plant. The roughing mills, finishing mills and tight iron mills are included in the order.

The American Screw Co., Providence, R. I., has indefinitely dismissed 300 employees and cut wages of retained workers 12½ per cent.

COMING MEETINGS

September

American Society for Steel Treating. Sept. 22 to 26. Annual convention and exhibition. Headquarters, Copley-Plaza Hotel; exhibition, Commonwealth Pier, Boston. W. H. Eisenmann, 4600 Prospect Avenue, Cleveland, secretary.

American Mining Congress. Sept. 29 to Oct. 4. Annual convention, Sacramento, Cal. J. F. Callbraeth, 814 Munsey Building, Washington, secretary.

National Safety Council. Sept. 29 to Oct. 3. Annual safety congress, Brown Hotel and Hotel Seelbach, Louisville, Ky. W. H. Cameron, 168 North Michigan Avenue, Chicago, managing director.

October

American Electrochemical Society. Oct. 2 to 4. Fall meeting and round-table discussions. Hotel Tuller, Detroit. Dr. Colin G. Fink, Columbia University, New York, secretary.

American Institute of Mining and Metallurgical Engineers. Oct. 13 to 15. Annual inspection trip and meeting at Birmingham. Frederick F. Sharpless, 29 West Thirty-ninth Street, New York, secretary.

American Foundrymen's Association. Oct. 13 to 17. Annual convention, Milwaukee. C. E. Hoyt, 140 South Dearborn Street, Chicago, secretary.

American Gear Manufacturers Association. Oct. 16 to 18. Semi-annual fall meeting, Briarcliff Lodge, Briarcliff Manor, N. Y. T. W. Owen, 2443 Prospect Avenue, Cleveland, secretary.

American Society of Mechanical Engineers. Oct. 20. Management week, New York City. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

Electric Power Club. Oct. 20 to 23. Fall meeting, Hotel Greenbrier, White Sulphur Springs, W. Va. Headquarters of association, B. F. Keith Building, Cleveland.

Motor Truck Industries. Oct. 21 to 27. First national motor transportation show. American Exposition Palace on Lake Shore Drive, Chicago. Capitol Building, 120 Madison Avenue, Detroit, headquarters.

National Defense Day Program in New York

To Minimize War Cost in Lives and Treasure, Announced
as the Policy of American Industry—Adequate
Preparedness as a Guaranty of Peace

ONE of the outstanding features of the observation of National Defense Day on Sept. 12, at the Engineering Societies Building, New York, was the reproduction in full size of one of the divisional units developed during the late war to take care of procurement of materials. This was arranged exactly as these units came into being as a result of the decentralization carried out after Washington became too congested for effective work. Such modifications as have been made in details by studies of the War Department were put into effect. Rapid-printing telegraph instruments were installed by the Western Union Telegraph Co. and complete telephone service by the American Telephone & Telegraph Co. Imaginary orders transmitted from the War Department in Washington were received, allocated among several leading industrial men present and dispatched to their mythical destinations for action.

Under supervision of General J. G. Harbord, president Radio Corporation of America, the office was quickly hooked up with the company's world-wide network and a latest type RCA radio ink recorder was set up to spell out communiqués and keep the office in continuous and immediate touch with the ever-changing military situation.

At the meeting in the auditorium of the building practically every seat on the main floor was occupied. Elbert H. Gary, chairman United States Steel Corporation, presided. The other speakers were Col. James L. Walsh of the Bankers Trust Co., reserve ordnance officer for the New York district, Major-General Robert L. Bullock, U. S. A., and Guy E. Tripp, chairman of the board Westinghouse Electric & Mfg. Co., who served during the war as chief of the production division on the National Defense Council with the rank of brigadier general.

Remarks by the Chairman

Judge Gary said, in part:

Every nation that has what is valuable is obligated to be prepared to defend against brutal attack or unjust effort to seize and appropriate. Even though a man is not inclined to guard the interests of himself, common decency requires him to furnish reasonable oversight and care to others who are weak and helpless. As a rule they who, in words or action preach peace at any price, are not possessed of anything worth having and are oblivious to the interests of others, including even their own dependents.

We know, by the experience of 1914-1918, that the cost of war was many times as large and the victory much longer delayed by reason of the lack of preparation on the part of the nations that defended. Billions of money and millions of men were lost as the result of neglect or indifference.

Every good soldier or civilian loves peace and hates war, if it can honorably be avoided. It is to insure peace, to prevent war, if possible, and to end war more speedily when waged, that the intelligent man or nation advocates or consents to defensive preparation.

The splendid army of the United States of America, enthusiastically supported by a wise, honest, economical Government, entertains the belief that the best interests of the country and all its inhabitants, without discrimination, demand the establishment and maintenance of a basis, at the lowest cost, for mobilizing and, if necessary, utilizing all the available resources of the nation, in the shortest time and most effective manner, to defend against military forces, if and whenever or however we may be attacked. To this end it has organized military divisions throughout the country

to provide and systematize the necessary measures. Of vital importance are included the industrial facilities.

Would Reduce War Reserves

After rehearsing the mistakes and losses due to unpreparedness in the late war, Col. James L. Walsh, chief of the New York Ordnance and Air Service Districts, said:

At present we are making haste slowly. It is estimated that it will take fully five years to complete all phases of the entire industrial preparedness program. In the first place, the War Department hasn't the officers to spare for this work, and in the second place the reserves of ordnance left over from the World War are, at this time, sufficient to insure arming our man-power as fast as it can be organized and trained. However, these reserves are deteriorating. Our small-arms ammunition reserve will be entirely valueless by 1928, and our artillery ammunition reserves will disappear five years after that, or 1933.

In the meantime we shall try to have the preliminaries to production in such shape that these reserves can safely be reduced to a great deal below the figures as now established. Munitions reserves are designed to bridge the gap between the declaration of war and the beginning of actual new production of war material. Manifestly the quicker we can get into production after war is declared, the smaller reserves will be needed, and—a fact not to be lost sight of—the smaller appropriations will be required to insure adequate industrial preparedness.

Without the help of American industry the War Department can accomplish little or nothing. But if each of us will pitch in and do a little bit, I am confident that we can make real progress. If we can achieve a degree of industrial preparedness that will match our man-power with adequate munition power, we can make our country an effective factor in keeping the peace of the world. Incidentally, through obviating the necessity of maintaining in times of peace huge stocks of war material, we will permit with safety a nearer approach to actual disarmament than we have ever heretofore known.

General Tripp Explains Plans

In his talk Brigadier General Tripp, who was chief of the Production Division during the war, said:

For the first time in the history of the United States American industry is being given an opportunity to learn beforehand what its war-time work may have to be. Heretofore we have consistently ignored the fact that we might ever be at war. If that policy had really saved us from fighting, I would be the last man to suggest a change.

But, unfortunately, in spite of our best intentions, we had to fight in 1812, 1845, 1861, 1898 and 1917, and each time in a truly dreadful state of unpreparedness. The consequences were the unnecessary expenditure of vast sums of money, great hardships to our troops, a loss of time which meant the loss of many lives, and on all except the last occasion a great deal of dishonesty on the part of contractors.

I do not think that even the most perfect of preparations is going to make war a pleasant thing for this country. Industry suffered greatly during the last war and will probably suffer worse if there is another. But at least we can minimize our difficulties, not especially for the sake of industry, but for the sake of the human beings who will bear the real burdens, because to help them is industry's job.

The plans for industrial defense that have been prepared by the War Department are undoubtedly the most satisfactory solution yet presented to the

problem of getting industry on a defense basis with the maximum of rapidity and the minimum of friction. They are thoroughly practical, and consequently American industry is gladly cooperating in them.

Among the representatives of American industry who were present at the New York meeting were the following:

R. F. Golden, general production manager, National Lock Washer Co., Newark, N. J.; A. W. Ericsson, secretary Ericsson Screw Machine Products Co., Brooklyn; N. S. Reeder, vice-president, Pressed Steel Car Co., Pittsburgh; N. S. Cumner, vice-president, Nestor Mfg. Co., New York; L. T. R. Brown, works manager, Watson Co., Attleboro, Mass.; B. J. Minnier, vice-president, New York Air Brake Co.; R. B. Sheriden, vice-president, New York Air Brake Co.; Mrs. Whitehouse, Whitehouse Leather Products Co.; N. B. Gatch, acting vice-president, Chicago Pneumatic Tool Co.; Addison J. Chase, Gould Mersereau Co., New York; H. W. O'Dowd, general superintendent, William M. Crane Co., New York; W. F. Howell, assistant secretary, Robert Gair Co., Brooklyn; E. A. Stillman, president, Watson-Stillman Co., New York; J. Barton Healey, president, American Welding & Machine Works, Warren, Ohio; Farnham Yardley, president and C. V. Barrington, vice-president, Jenkins Bros., Bridgeport, Conn.; F. D. Jackson, president, Hecla Iron Works, Brooklyn; C. E. McPhall, manager, National Lead Co., Baltimore; C. H. Markillie, sales manager, National Lead Co., New York; M. N. Adler, mahager and V. R. Kakatnur, Essex Specialty Co., Berkley Heights, N. J.; Otto Best, general manager, Nathan Mfg. Co., New York; A. S. Roder, president and C. B. Lee, treasurer, United States Radium Corporation, New York; G. W. Struble, manager ordnance, Bethlehem Steel Co., Bethlehem; R. W. Gillispie, assistant sales manager, Bethlehem Steel Co., New York; L. H. Buttenheim, vice-president, McKiernan-Terry Drill Co., New York; Henry M. Cleaver, assistant to president, Niles-Bement-Pond Co., New York; Edward A. Fitch, works manager and A. C. Smith, engineer, Otis Elevator Co., New York; H. L. Haas and J. Schnella, Henry Haas & Son, New York; R. J. Magor, president and A. Van Hassel, sales manager, Magor Car Corporation, New York; F. K. McCausland, publicity, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; C. R. Britton, manager production, Monroe Calculating Machine Co., New York; F. K. Payne, vice-president, American Meter Co., New York; Thomas Jardine, secretary, Unexcelled Mfg. Co., New York; A. E. Ostrander, vice-president, American Car & Foundry Co., New York; M. H. Kern, vice-president and H. D. Telcomb, Roberts Numbering Machine Co., Brooklyn; Wayne Burns, sales manager and W. H. Lentz, assistant sales manager, United States Gage Co., New York; F. H. Chamberlain, president, National Sponge & Chamois Co., New York; C. A. Hanson, vice-president and R. R. Mead, chief engineer, Mergenthaler Linotype Co., Brooklyn; Neil C. Lamont, assistant to vice-president and William Schwaubhauser, chief engineer, Worthington Pump & Mfg. Co., New York; W. G. Zeigler, assistant to president, Schaeffer & Budenberg Mfg. Co., Brooklyn; H. Swinglehurst, general manager and A. E. Page, chief engineer, Scott & Williams, New York; J. F. Borland, vice-president, Huhn Mfg. Co., Newark, N. J.; Frank Kramer, vice-president and Claude Earley, managing director, American Lithograph Co., New York; H. H. Williams, Metropolitan Engineering Co.; J. H. Dunning, president and E. B. Strange, vice-president, J. H. Dunning Corporation, New York; T. K. Burns and H. A. Brown, Jr., Hyatt Roller Bearing Co., Harrison, N. J.; S. J. Meeker, secretary, Meeker Foundry Co., Newark, N. J.; K. J. Ralson, Nassau Smelting & Refining Co., New York; C. C. Walte, Snead & Co., Jersey City; R. W. Strout, E. W. Bliss Co., Brooklyn; G. H. Klippel, superintendent and G. H. Gaskins, chief draftsman, International Mercantile Marine Co., New York; Fred L. Eberhardt, Gould & Eberhardt, Newark, N. J.; R. C. Jeffcott, president and Col. W. S. Weeks, secretary, Calco Chemical Co., Bound Brook, N. J.; A. M. Luce, Atlantic Terra Cotta Co., New York; Francis W. Hay, Hay Foundry & Iron Works, Newark, N. J.; R. F. Dalton, president, Agricultural Terra Cotta Co.; C. A. Moore, Jr., president and J. N. Davis, Manning, Maxwell & Moore, New York.

BRITISH FOREIGN TRADE

July Exports Slightly Larger Than the June— Imports Also Increase

British steel exports in July at 347,799 gross tons were larger than the June figures of 334,775 tons. The July movement was larger than the average for the first half, at 337,047 tons per month, but less than the monthly rate in 1923.

July imports at 247,154 tons were the second largest for the year and compare with 251,249 tons per month as the average for the first half. They both largely exceed the 1913 or any post-war monthly volume.

Comparative data for both exports and imports, scrap included, are as follows:

British Steel Exports and Imports, Gross Tons			
	Exports	Imports	
July, 1924.....	347,799	247,154	
Average per month to July, 1924	337,047	251,249	
Average per month, 1923.....	369,800	127,800	
Average per month, 1922.....	295,980	82,215	
Average per month, 1921.....	144,885	152,734	
Average per month, 1920.....	274,881	128,685	
Average per month, 1919.....	188,519	50,801	
Average per month, 1913.....	420,757	195,264	

More detailed data of the exports are as follows:

Principal British Exports, Gross Tons per Month				
	1913	1923	July—1924	
Pig iron }	93,700	74,100	36,938	35,541
Ferroalloys }	42,200	25,700	16,512	8,711
Steel rails	11,200	17,700	24,473	12,526
Steel plates	63,500	53,800	13,801	18,844
Galvanized sheets.....	20,900	31,500	40,527	57,108
Steel bars, rods, etc....	41,200	48,300	29,646	29,431
Tin plates	11,700	29,500	39,993	46,867
Black plates and sheets			29,808	34,815

Exports of scrap iron and steel in July were 8051 tons, compared with 9815 tons per month in 1923 and with 12,880 tons per month in 1922. In 1913 they were 9600 tons per month.

Data as to importations of importance are as follows in tons per month:

	1913	1923	July, 1924
Iron ore	620,000	487,580	610,724
Manganese ore	50,100	43,420	27,629
Pig iron and ferroalloys	18,000	9,157	17,504

Imports of semi-finished steel to Aug. 1 were 623,791 tons, compared with 329,317 tons for the same seven months in 1923. Of this year's total 315,797, or over half, came from Belgium.

Substantial Gain in Sheet Sales by Independent Makers Last Month

August sheet sales of manufacturers reporting to the National Association of Sheet and Tin Plate Manufacturers were almost exactly 72,000 tons greater than those for the month before and only slightly less than 100,000 tons greater than for June, which was the smallest month of the year. The gain in production and shipment in August as compared with the month before was not as great as that in sales, but the end of the month found the mills which reported with unfilled orders exceeding those of one month before by more than 33,000 tons.

Sales were equal to 71.2 per cent of August capacity (based on the number of working turns possible); production, 65.2 per cent; shipments, 60.7 per cent; unfilled orders, 81 per cent; unshipped orders, 24 per cent; and unsold stocks, 14.6 per cent.

The figures in net tons for August compare with those for the two preceding months and with August last year, as follows:

	1924		1923
	August	July	August
*Capacity, all mills	401,700	413,000	395,800
Per cent reporting.....	72.7	71.7	71.0
Sales	207,986	135,998	108,693
Production	190,436	144,291	114,807
Shipments	177,498	151,255	141,176
Unfilled orders.....	236,614	203,440	246,810
Unshipped orders..	70,094	70,798	82,465
Unsold stock.....	42,635	39,621	45,776

*Based on number of working turns possible.

STEEL ELECTRICAL ENGINEERS

Annual Convention and Exhibition Opens at Pittsburgh

PITTSBURGH, Sept. 16.—Technical sessions of the nineteenth annual convention of the Association of Iron and Steel Electrical Engineers were started at the Duquesne Garden this morning with a paper by L. A. Umansky, General Electric Co., Schenectady, N. Y., on "Adjustable Speed Sets for Rolling Mills." He was followed by E. G. Bailey, Bailey Meter Co., Cleveland, with a paper on "Combustion Control." Yesterday was given over to registration and to a general business meeting at the William Penn Hotel, at which reports of officers and committees were presented and officers were elected for the coming year. A. C. Cummins, Duquesne Works, Carnegie Steel Co., is the new president.

The program for tomorrow, designated as "Electric Heating Furnace Day," calls for papers on "Medium and Low Temperature Applications," by E. A. Hurme, Westinghouse Electric & Mfg. Co., East Pittsburgh; on "Medium Temperature Furnace Installations," by C. F. Cone, George J. Hagan Co., Pittsburgh; on "Electric Melting Furnaces," by J. A. Seede, General Electric

Co., Schenectady, and on "Electric Heating with Special Reference to Central Stations," by E. D. Sibley, Metropolitan Edison Co., Reading, Pa.

On Thursday A. C. Cummins, Duquesne Works, Carnegie Steel Co., will present a paper, the subject of which is "Developments in Electric Repair Shop Practice," to be followed by Walter Greenwood, Ohio Works, Youngstown, Carnegie Steel Co., whose subject is "Crane Hoists Travel Limit Devices." H. K. Huessener, American Heat Economy Bureau, Pittsburgh, has a paper entitled "The Slagging Producer in Steel Works," and John F. Kelly, secretary of the association, Pittsburgh, one on "Machine Tools and Their Auxiliaries."

Friday is "Central Station Day," and the papers scheduled for presentation include a joint one by Merrill Skinner, Duquesne Light Co., Pittsburgh, and F. D. Mahoney, West Penn Power Co., Pittsburgh, on "The Steel Industry and the Electric Utilities," and one by Barton R. Shover, Pittsburgh, on "Power in the Iron and Steel Industry in America." The annual banquet, commemorating the thirtieth anniversary of the adoption of electric motors for use in the manufacture of iron and steel, will be held at the William Penn Hotel, Thursday evening.

Exhibitors at the exposition held in conjunction with the convention number 113.

PITTSBURGH PLUS CONTROVERSY

Keen Interest Felt in Attitude of United States Steel Corporation

WASHINGTON, Sept. 16.—Answer of the United States Steel Corporation to the cease and desist order of the Federal Trade Commission being due on Saturday, Sept. 20, it is being looked forward to here with great interest. Manifestly, the commission is not attempting to predict the action of the Steel Corporation. It will make no comment on published reports that the Steel Corporation will announce its purpose to comply with the order. But in the event it does make known such purpose, the answer will be studied, it is understood, through Attorney H. K. Steinhauer, to see if it conforms entirely or "substantially" to the order. Mr. Steinhauer, who has been in the West, is expected to return to Washington some day of the present week. Should the Steel Corporation determine to appeal the case to the courts, it is assumed the commission would prepare at once to contest the proceedings.

The question of complying with the order by quoting prices of steel f. o. b. mill, or so invoicing sales that buyers would know the exact freight rate to point of delivery, is being given study by other industries as well as the steel trade, according to reports coming here, indicating that should the Steel Corporation do away with the so-called Pittsburgh base, other industries also will turn from quoting prices at given base points, so that in this sense it is said the effect of the order as to policy of quoting prices, whatever it may be as to actual prices paid by consumers, will be rather far reaching in the industrial section of the country.

Speculation as to Results

More or less speculation has developed as to what, if anything, the commission might do should steel prices be quoted f. o. b. mill, yet the prices be varying in character, as, for example, the quotation by a mill of 2c., f. o. b. plant, on steel bars to one consumer, and a lower price, f. o. b. mill, to another consumer, under the claim that the latter is located in a more competitive territory than the former, and the lower figure is done to meet competition in good faith and is not unfair price discrimination within the meaning of the Clayton Act. This phase of the issue has been given considerable study by legal minds, some of whom think the courts finally will have to interpret the meaning of "meeting competition in good faith." It is pointed out that producers might assume, among other things, that not only would the situation presented be compliance

with the order but that a mill so doing might be justified in pointing out to the buyer paying the higher price that whether the other purchaser is a competitor of the other consumer or not, selling to him at a lower figure is called for by competitive conditions as well as the need for heavier rolling schedules that reduce overhead and other costs and their absence would make a price higher than the 2c. necessary. It is held to be conceivable that this and other points may yet be developed before the case is ultimately threshed out. Some claim, however, this policy could not be maintained any more than freight zones of past years were.

National Tube Co.'s Position

The trade's interest in dismissal by the commission of the complaint against the National Tube Co. seems to have been aroused only recently. It is understood that pipe was struck from the list of products which are affected by the cease and desist order on the theory that the center of production of pipe is in the Pittsburgh and surrounding territory, embracing such points as Youngstown and Lorain, Ohio; Wheeling, W. Va., and McKeesport, Pa., and that it should be excluded under the so-called "marginal principle," which was discussed by the economists appearing in the case. Under this principle as defined by them it at least implies one price in the market, which, normally, is the price of the high cost unit and is based on the law of supply and demand and represents the "last unit" of production to meet requirements. Buyers in the South of oil country goods, and others, are said to have found this principle to be entirely applicable. The fact that pipe is quoted on a discount basis is said to have had nothing to do with the exclusion of pipe from the list of steel products included in the cease and desist order. The commission maintained that the Pittsburgh base quotation on products named in the order, bars, shapes, plates, tin plate, wire and wire products and sheets, is not justified by the law of supply and demand.

The New England Foundrymen's Association held its first 1924 fall meeting Wednesday, Sept. 10, at the Exchange Club, Boston. M. J. House, M. J. House Associates, New York, was the guest of the evening. Mr. House discussed cooperative or uniform cost accounting in foundries and allied industries. The advantages derived from uniform cost accounting were outlined from a selling as well as estimating standpoint. He also offered a concise explanation of a simply operated plan adaptable to plants of any size or type.

European Markets Mostly Stagnant

Germany Begins to Rebound from Bottom—Dawes Accord
Credited with Great Helpfulness—Britain
Pessimistic

(By Cable)

LONDON, ENGLAND, Sept. 16.

PIG iron and steel markets are still dull and depressed. Pig iron demand is slack with sales of a restricted tonnage only. Cleveland prices are falling further, but consumers are not attracted.

Hematite shows a steadier tendency but makers' stocks are accumulating and it is possible to secure concessions. Foreign ore is easy. Bilbao Rubio is being sold at 21s. 6d. (\$4.79) c.i.f. Tees.

Finished steel is deadily dull except for light-gage materials. Prices are unchanged, as makers are unwilling to reduce them further.

August exports of pig iron amounted to 33,900 tons, of which 4650 tons went to the United States. The total exports of finished iron and steel were 301,057 tons.

Sheets and Tin Plate

Tin plate is steady but the demand is much quieter since the recent rise in minimum prices. Makers generally are well placed, some working into stock. The Far East is the most active export buyer.

Galvanized sheets are steady but in poor demand.

Black sheets are firm, but the Far Eastern demand is not sustained. Some makers are booked heavily to the end of the year; others are offering, for November onward, thin Japanese specifications.

On the Continent of Europe

The Continental position is obscure. Works wanting orders are reducing prices; others are disinclined to quote. Basic pig iron in small lots is being sold at 74s. (\$16.50) f.o.b.

Billets are being done at £5 5s. (\$23.42) f.o.b. Sheet

bars are sold at £5 12s. 6d. (\$25.09) f.o.b. Wire rods are firmer, up to £6 12s. 6d. (\$29.55) f.o.b. being named.

GERMAN STAGNATION LESSENS

Prices Beginning to React and Demand to Quicken
—Many Firms Still Reducing Output

BERLIN, GERMANY, Aug. 28.—Decreases in German iron prices have come to a halt. They probably have reached their lowest mark, as a slight improvement is again noticeable and customers gradually are giving up their reserve in placing orders, in expectation of higher prices later on. The main reasons for the change are the strong reduction in output and the optimism prevailing in certain quarters that, owing to the satisfactory conclusion of the London Conference, business will live up shortly. Generally prices still vary, especially as a large number of orders which the works accepted at a low figure during the last few weeks have still to be executed. The uncertainty in which way the outcome of the London Conference will influence the iron market is still noticeable also in prices. Yet the tendency is unmistakably upward and present quotations are on the average as follows:

	Gold Marks per Metric Ton	Per Gross Ton
Ingots	95	\$23.00
Blooms	102	24.68
Billets	107	25.89
Sheet bars	110	26.62
Wire Rods	135	32.67
		Cents per Pound
Bar iron	120	1.30
Structural shapes	117	1.26
Hoop iron	170	1.84
Sheets, heavy	135	1.46
Sheets, medium	150	1.62
Sheets, 1 to 3 mm. (No. 19½ to No. 11½ gage).....	165	1.78
Sheets, below 1 mm.....	180	1.95
Wire, bright	170	1.84
Wire, galvanized	215	2.32

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.46 per £1, as follows:

Durham coke, del'd..	£1 6s.	\$5.80
Bilbao Rubio ore†...	1 4	5.35
Cleveland No. 1 fdy..	4 7½	19.51
Cleveland No. 3 fdy..	4 2	to £4 2½s. 18.29 to \$18.40
Cleveland No. 4 fdy..	4 1	18.09
Cleveland No. 4 forge	4 0	17.84
Cleveland basic	4 2½	18.40
East Coast mixed....	4 11	20.29
East Coast hematite..	4 19	to 5 0 22.08 to 22.30
(a) Ferromanganese..	13 10	and 13 0* 60.21 and 57.98*
Rolls, 60 lb. and up..	8 5	to 9 0 36.80 to 40.14
Billets	7 10	to 8 5 33.45 to 36.80
Sheet and tin plate bars, Welsh	8 12½	38.47
Tin plates, base box..	1 3½	5.24
		C. per Lb.
Ship plates	9 5	to 9 15 1.84 to 1.94
Boiler plates	13 0	to 13 10 2.59 to 2.69
Tees	9 7½	to 9 17½ 1.87 to 1.97
Channels	8 12½	to 9 2½ 1.72 to 1.82
Beams	8 7½	to 8 17½ 1.67 to 1.77
Round bars, ¾ to 3 in.	9 12½	to 10 2½ 1.92 to 2.02
Galv. sheets, 24 gage	18 5	to 18 10 3.63 to 3.68
Black sheets, 24 gage	13 0	to 13 5 2.59 to 2.64
Black sheets, Japanese specifications	15 5	3.04
Steel hoops	10 15	and 12 10* 2.14 and 2.49*
Cold rolled steel strip, 20 gage	17 0	3.39

*Export price.

†Ex-ship, Tees, nominal.

(a) Nominal.

Continental Prices, All F. O. B. Channel Ports (Nominal)

Foundry pig iron:			
Belgium	£3 18s.	to £4 0s.	\$17.39 to \$17.84
France	3 18	to 4 0	17.39 to 17.84
Luxemburg	3 18	to 4 0	17.39 to 17.84
Billets:			
Belgium	5 7½		23.97
France	5 7½		23.97
Merchant bars:			C. per Lb.
Belgium	5 17½	to 6 5	1.17 to 1.24
Luxemburg	5 17½	to 6 5	1.17 to 1.24
France	5 17½	to 6 5	1.17 to 1.24
Joists (beams):			
Belgium	5 15	to 6 0	1.15 to 1.19
Luxemburg	5 15	to 6 0	1.15 to 1.19
France	5 15	to 6 0	1.15 to 1.19
Angles:			
Belgium	8 0	to 8 5	1.59 to 1.64
½-in. plates:			
Belgium	7 0	to 7 10	1.39 to 1.49
Germany	7 0	to 7 10	1.39 to 1.49
¾-in. plates:			
Luxemburg	7 0	to 7 10	1.39 to 1.49
Belgium	7 0	to 7 10	1.39 to 1.49

Generally the works have orders for about five weeks, but they are working with a largely reduced number of men. Some firms still are reducing output. The Gutehoffnungshütte is closing down the rolling mills at Oberhausen and at Neu-Oberhausen, which entails the dismissal of about 1400 men. In the Siegerland a great number of works are closed. The Phoenix Iron Works at Hörde has stopped producing at the mills. The Dortmunder Union and the Bochumer Verein also have reduced the output of rolled material and the Düsseldorfer Eisen-und Drahtindustrie intends to close down altogether. The Iron Works Oberbilk at Düsseldorf is giving notice to a large number of its employees; the Rheinmetall company is dismissing 50 per cent and the Friedrich Wilhelm Hütte at Mülheim is closing down the foundry. At many works production has been reduced by about one-third.

Slow Resumption in Placing Orders

Demand has somewhat improved, due to the view that prices have reached the lowest level and that, with a satisfactory outcome of the negotiations with the Allies, business will revive and prices advance. Many orders which have been held back since before the London Conference are being placed. Especially in semi-finished material, mainly blooms and sheet bars, demand is livelier. There is also a strong demand in sheets and rolled wire, the latter mainly foreign.

It seems, however, that some time will elapse before the more friendly aspect in international relations and its influence on trade and industry will lead to greater employment in the iron industry and to an increase in output. The tube market is still stagnant and firms are selling about 10 per cent below the

official syndicate prices. The pig iron trade is slightly livelier, and a certain amount of foreign pig iron is still imported, mainly from Lorraine. The German iron works have slightly raised their export prices. Bar iron is quoted at £6 5s. (1.25c. per lb.) per ton, heavy sheets at £7 5s. (1.45c.), medium sheets at £8 (1.60c.). Belgian quotations in sheets are higher, but in thin plates they are cheaper.

Uncertainty in Scrap Prices

On the scrap market, always the first to be influenced by any new tendency in the iron trade, the upward move already is taking place, but prices still are fluctuating greatly, a sign of the uncertainty prevailing. Scrap prices, which had decreased sharply for several months, have been fairly steady during the last four weeks. They now show an upward tendency; steel scrap has advanced from about 49 marks per ton (\$11.85), during the last few days of July, to about 65 marks (\$15.73), which is considerably above the pre-war average. But the turnover is still small, as most of the large iron works, except Krupp, Mannesmann and Gutehoffnungshütte and a few others, are not in the market.

The Upper Silesian works also are only poorly employed. They are showing a small demand and the Schrotteinkaufsgesellschaft (scrap buying company) is paying only 41 to 43 marks per ton (\$9.92 to \$10.41), f.o.r. Berlin. The foundries are showing a larger demand for cast iron scrap and prices of machine scrap have advanced to 70 marks per ton (\$16.94), f.o.r. It is expected that, with the reestablishment of more normal conditions in the Ruhr district, the scrap trade will be more lively.

BELGIAN MARKET NOT IMPROVED

Iron and Steel Demand Light and Prices Weak—German Competition in Sheets Serious

BRUSSELS, BELGIUM, Sept. 4.—The market continues weak and the situation appeared still less favorable at the Brussels Bourse last session, as the movement of trade was almost at a standstill, inducing the plants to curtail their prices further. Efforts were made, following the revival of the franc, to enhance the prices in £, but they were unsuccessful. Prices vary according to the position of sellers; they are notably below the pre-war gold parity. This might indicate that the rock-bottom level has been reached for the prices expressed in £; unfortunately, the requirements of the world markets remain lower than production.

But why should the world requirements be so low? This is due to the economical and political situation of Europe being no clearer since the acceptance of the London agreements. To account for the diminution of demand, production also is getting lower and some of the plants are expected to close down shortly.

Pig Iron.—There is little doing in the pig iron market; selling prices have about reached cost and many producers refuse to quote any lower. On the other hand, the expectancy of a decrease in the price of coke does not induce transactions. Competition is keen both in Lorraine and Luxemburg. The following rates are purely nominal: chill-cast iron No. 3 is worth 330 to 340 fr. (\$16.74 to \$17.25); basic iron, 320 to 330 fr. (\$16.23 to \$16.74).

Semi-Finished Products.—This department remains quite unsettled, with changeable quotations. Prices offered by the British buyers are so low that they are unreasonable, as for instance: £5 3s. to £5 4s. (\$23.02 to \$23.24), for blooms; £5 7s. 6d. to £5 8s. 6d. (\$25.03 to \$25.25), for billets; £5 12s. 6d. to £5 13s. 6d. (\$25.15 to \$25.37), for targets. The Lorraine and Luxemburg plants, thanks to their important production, are in a better position than the Belgian plants. The nominal rates for basic steel are, for blooms, 450 to 460 fr. (\$22.82 to \$23.33); for billets, 485 to 495 fr. (\$24.60 to \$25.10); targets, 515 to 520 fr. (\$26.12 to \$26.39).

Foundry Iron.—There is still a paucity of business

in this section; scrap being abnormally dear and selling prices weak and difficult to maintain. Some plants are reducing prices to secure orders. Iron No. 2 is quoted 550 to 560 fr. (\$27.90 to \$28.40) per ton f.o.b., and No. 3, 580 to 590 fr. (\$29.42 to \$29.93) f.o.b.

Finished Steel.—The market is weak, trading scarce and difficult to conclude. Prices are unstable in respect to the bulk of orders. Some dealings have been made with India and South America; Japan is holding back, while trade with China is hampered by the political situation there. Nevertheless, these low rates should attract the attention of oversea buyers.

For export, beams and bars are maintained at £5 17s. 6d. to £5 18s. 6d. (2.35c. to 2.37c. per lb.). The Luxemburgers are active while Lorraine plants fairly well booked ahead, are not hard competitors for the Belgians. Export prices for beams are 520 to 525 fr. (1.18c. to 1.19c.); bars, 520 to 530 fr. (1.18c. to 1.20c.); rods, 600 to 650 fr. (1.36c. to 1.47c.); wire rod, 610 to 620 fr. (\$30.94 to \$31.45); hot rolled hoops, 775 to 800 fr. (1.76c. to 1.81c.); cold rolled hoops, 1100 to 1150 fr. (2.49c. to 2.60c.).

Sheets.—Trading remains difficult and prices weak. Heavy sheets are depressed, owing to German competition, making tenders vary from £7 to £7 2s. 6d. (1.40c. to 1.42c.). The Belgian plants deal at 630 to 650 fr. (1.43c. to 1.47c.) f.o.b. Antwerp; no orders are obtainable at £7 5s (1.45c.). Medium and especially light sheets are in a more favorable position. The following grades are still quoted: 3 mm., (No. 11½ gage) 700 fr. (1.59c. per lb.); 2 mm., (No. 14 gage) 775 fr. (1.75c.); (No. 16½ gage) 1.5 mm. 890 fr. (2.02c.); 1 mm. (No. 19½ gage) 1050 to 1075 fr. (2.38c. to 2.43c.); 0.5 mm., (No. 25½ gage), 1200 to 1250 fr. (2.72c. to 2.83c.).

Old Material.—The scrap market has improved and quotations could be enhanced; nevertheless, trading is heavy and prices too high in respect to the prices applied on new products. Open-hearth scrap is worth 280 to 290 fr. (\$14.20 to \$14.70); blast furnace, 250 to 260 fr. (\$12.68 to \$13.20); shavings, 200 to 220 fr. (\$10.15 to \$11.16); No. 1 machinery cast, 340 to 350 fr. (\$17.25 to \$17.75).

The American Association of Engineers has established a new Washington office as an aid to Congress and the engineering profession.

CHINESE MARKET QUIET BUT FIRM

Political Situation Prevents Safe Shipment to Interior—German Prices Low—Stocks of Nails

SHANGHAI, Aug. 23.—While the general trend of business in iron and steel is dull a turn for the better is expected by the end of September. Supplies of most products are fairly heavy in Shanghai, and although a certain tonnage is moving into the interior it is in many cases at prices less than cost. Also, the political situation in the interior is not stable, and merchandise cannot be moved too freely. Wire nails are selling in Shanghai at 4 taels per keg, which is below replacement costs. German houses have been able to sell wire nails in the market cheaper than other foreign producers, their quotations being about 20 per cent below those of American manufacturers. The Germans have done considerable business in bars, but a fair tonnage has been going to British sellers, although their prices are about 5 per cent higher. British makers, however, are able to ship in about two weeks.

Belgian exporters have been successful in booking some business, their prices comparing favorably with German quotations, especially on wire nails. Trading with Germany is facilitated by the favorable exchange, Chinese dealers assuming the risk resulting from fluctuation of the mark. Some activity is reported in tubes, galvanized sheets, reinforcing bars and general lines. There have been some small transactions in bamboo steel.

Construction in Shanghai shows a decline from the records of previous years. It is stated that the new Customs House in Shanghai will call for 3000 tons of steel. Bids on part of this material will be opened in London.

Locally there are sufficient stocks of iron and steel products to carry the dealers through until autumn. For instance, in wire nails alone there are reported to be close to 100,000 kegs in stock. Even in second-hand material, in which there is usually active trade, there has been an absence of interest, because of the difficulty experienced by dealers in moving their supplies. Despite the absence of any important demand the second-hand material market continues fairly firm.

While business conditions cannot be described as active, there is a fairly steady movement in iron and steel, limited though it is to small lots, with only an occasional order of size. Buying is light, but the numerous small orders help to make up fairly substantial totals, and from this viewpoint business is expected to be in a better condition before long.

Detroit Scrap Market

DETROIT, Sept. 16.—Dealers and producers report an increased demand for practically all lines of scrap, with some sizable inquiries pending. Flashings and No. 1 busheling are active and heavy melting steel is slightly higher. The tendency throughout the list is toward higher prices.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$15.25 to \$15.75
Shoveling steel	15.00 to 15.50
Borings	11.75 to 12.25
Short turnings	11.50 to 12.00
Long turnings	10.50 to 11.00
No. 1 machinery cast.....	16.00 to 17.00
Automobile cast	18.00 to 18.50
Hydraulic compressed	13.50 to 14.00
Stove plate	14.00 to 14.50
No. 1 busheling.....	13.00 to 13.50
Sheet clippings	8.50 to 9.00
Flashings	11.75 to 12.25

Most of the ore used by the Youngstown Sheet & Tube Co. at its properties in the Mahoning Valley is unloaded at Ashtabula and Cleveland, and transported in solid trains of from 60 to 80 cars. The cars are unloaded at the main plant and at the Brier Hill works by a car dumper into the ore yards at the rate of about 450 cars per 24 hr. At the company's Hubbard blast furnace plant, the unloading is necessarily slower.

TIN PLATE BUYING RESUMED

Inquiries in Other Lines Gain, but European Competition Is Severe

NEW YORK, Sept. 16.—Except for renewed buying of tin plate by Japan, business for export is sluggish. Not that demand is lacking, for inquiries are frequent and varied, but European competition in rails and other finished products is an obstacle against which American firms can do little. Exports of iron and steel during July amounted to only 138,845 gross tons, a decline of 16 per cent from June. Consignments diminished most noticeably in black and galvanized sheets, scrap, tin plate and bars, but shipments of structural shapes, plain material, were nearly double those of June.

The inquiry from Japan for 500 tons of sheet piling, noted previously, was placed with Mitsubishi Shoji Kaisha, New York, at about \$64.50, c.i.f. Japan. One large export house sold 3000 boxes of tin plate for Japan at \$5.85, c.i.f. Japan. Another firm is said to be moving about 10,000 boxes per week, and brisk buying is expected until about Dec. 1, chiefly due to an effort to build up stocks in Japan before the change to the ad valorem tariff, effective March 10.

Otherwise the market is quiet. There is an abundance of black sheet inquiries, but prices here are too high to attract orders. While exporters must ask from \$95 to \$95.50 for black sheets, selling prices from stock in Japan are from \$90 to \$92. Stocks of finished materials there are estimated at 280,000 tons.

Rail requirements in Japan are about 50,000 tons yearly; since purchases thus far amount to only 22,000 tons, further buying from the United States might be expected soon but for one factor—low European prices. The inquiry a few days ago for 370 tons of 75-lb. rails is said to have been placed in Europe at \$35.

Receiver Appointed for Matthew Addy Co.

The Matthew Addy Co., Cincinnati, dealer in pig iron, coal and coke, went into the hands of a receiver on Sept. 12. Frozen assets which cannot be realized upon at the present time, and the uncertainty of pending litigation, both for and against the company, resulted in the action. Through mutual agreement between the company and a committee representing a number of its creditors, John H. Dickerson, formerly president of the Cincinnati Business Men's Club, was named as receiver and his bond was fixed at \$10,000. Attorneys for both sides agreed that a bond of this amount would be sufficient to take care of all liquid assets that would come immediately into his hands.

The receivership followed three weeks of conferences and negotiations by the company's creditors, who sought to assist the firm to work out its difficulties. Creditors were agreed on reorganization plans, but the officers and directors were not able to unite in the agreement.

The fixed assets of the Matthew Addy Co. are estimated at more than \$1,000,000, while the merchandise liabilities approximate \$525,000. In addition to the merchandise liabilities, the company has a large amount of contingent liabilities, including pending litigation, the outcome of which is still in doubt. Attorneys agreed that the firm's books showed it to be solvent, but that actual solvency depended upon how much it would be able to realize from its coal and fluorspar properties and how it would come out in the pending litigation.

Former Judge John Weld Peck, representing the company, in his answer to the receivership suit, stated that "the company organized the Matthew Addy Steamship Corporation and a number of claims were filed against this company. Because it was a subsidiary of the Matthew Addy Co. the creditors tried to hold the Matthew Addy Co. responsible."

The L. Hardy Co., Worcester, Mass., manufacturer of machine knives, etc., has distributed its seventh annual bonus among operatives at the plant, with amounts ranging from \$10 to \$320, according to term of service with the company.

NEW HAVEN TOOL EXHIBIT

More Machines Shown Than in Previous Years—

Dr. Burgess on Government and Machine Tools

NEW HAVEN, CONN., Sept. 15.—The machine tool exhibition, held annually since 1921 at Mason Laboratory under the joint auspices of the New Haven section of the American Society of Mechanical Engineers, Yale University and the New Haven Chamber of Commerce, opened here today. The first technical session was held in the evening and was addressed by Dr. George K. Burgess, director U. S. Bureau of Standards, Washington. His subject was "The Government and the Machine Tool Industry."

More than 120 companies are represented at the exhibition and the floor space occupied totals approximately 11,000 sq. ft., which is 2500 sq. ft. more than last year. A wide variety of equipment is being shown, the tools for the most part being in actual operation. If the attendance and interest shown during the first day continues through the remaining days, Sept. 16, 17 and 18, the success of the exhibition is assured.

In addition to technical sessions and meetings of standardization committees, visits to the plants of the O.K. Tool Co., Shelton, Conn.; the New Haven Clock Co., and the A. C. Gilbert Co., manufacturer of mechanical toys, New Haven, have been planned.

Machine Tool Industry Basic

The machine tool industry was cited by Dr. Burgess in his address at the opening technical session, as one of the most important of our key industries, and it was pointed out that upon the development and healthy condition of that industry, depend in large part the progress and economical output of several other of our largest industries, such as the automotive, agricultural machinery and electrical equipment industries, and especially in time of war, the production of ordnance material.

The development of machine tools, the Taylor system of planning and executing work, and improved materials for cutting tools were emphasized as having progressed side by side and to have given its preeminent position to the American metal product and machinery industry. "Perhaps," said Dr. Burgess, "the outstanding characteristics of the machine tool are adequacy of design for the purpose, long life under severe usage, simplicity and speed of operation, and accuracy or identity of product within well defined and often extraordinarily close tolerances. All these characteristics are constantly being studied with a view to their improvement, by manufacturers, engineers and technical committees, in shop, laboratory and around the council table."

The activities of the Federal agencies interesting themselves in machine tools were outlined. The Department of Commerce has three great service bureaus: Census, foreign and domestic commerce and standards. The first concerns itself with statistics, the second with business and the third with science and technology. There is also the division of simplified practice, whose function it is to assist industry in reducing types, varieties and styles of products. The Bureau of Standards, in addition to its work of testing and experimental research, is also acting often in association with other bodies in formulating specifications for materials, performance of machines and instruments and preparing standards of practice and safety codes.

It was emphasized that the War and Navy departments have, in the arsenals and navy yards, great manufacturing establishments which are vitally interested in machine tools and their accessories, such as gages, and in many problems relating to standardization.

The function of the Federal Specifications Board, the creating of the National Screw Thread Commission, which meets in this city during the week and is about to issue its second report, and the several government departments represented on the American Engineering Standards Committee were referred to. Problems in which the Bureau of Standards interested itself included the relation between inches and millimeters, and the temperature of standardization. It was pointed out

that at present there is a slight discrepancy between the conversion factors in use in the United States and in Great Britain, and in length measurements of the highest precision this discrepancy leads to inconvenience and uncertainty. In regard to standard temperature for the measurement of machine parts, graduated scales, gages, etc., it was said that in view of the wide use of 68 deg. Fahr. (20 deg. C.) there can be little doubt that this temperature should be adopted.

The work being done by the Bureau of Standards along the general lines of dimensional standardization and in the field of precision screws and gages was discussed by Dr. Burgess. Work on the production of precision screws was described as the outgrowth of demands from manufacturers of dividing engines and similar apparatus for screws of high accuracy. Screws of higher accuracy than previously attained have been produced. The work is being continued and it is expected that within a relatively short time the bureau will be able to meet the most exacting demands of industry and science in this important field. The bureau's work in the development of methods for the production of precision gage blocks was also outlined.

Metallurgical Items

The metallurgical items in which the bureau is co-operating with the machine tool industry include researches relating to heat treatment and performance of high-speed lathe tools and the study of steels for gages. The work on high-speed steels originally consisted of a critical survey of so-called competitive breakdown tests used by large consumers as the basis of purchase of high-speed steels. Subsequently a study was made of the heat treatment of several important commercial types in this group of steels and at the present time attention is being given to tool performance in rough turning different carbon and alloy steels, first heat treated in various ways.

Other metallurgical researches in progress of particular interest to the machine tool industries included the investigation of quenching media for heat treatment, especially in relation to the hardening of carbon steels, the investigation of the effect of quality of steel upon the results obtained in case hardening.

Simplified Practice of Interest to Tool Industry

As to simplification, the program of the division of simplified practice was mentioned as covering several items of interest to the machine tool industry. In milling cutters it was stated that up to date a simplification program involving a 30 per cent elimination of varieties has been drafted and a general conference on the subject is imminent. In the field of taps and dies a survey is in active progress and it is thought that a 32 per cent elimination of varieties may be eventually practicable. In lock washer and lock nut manufacture the committee is of the belief that eventually definite eliminations in diameters and thicknesses will result in cutting off approximately one-third of the present list. In drills and reamers an eventual elimination of at least 15 per cent is contemplated. Other items discussed were arbors for drill chucks, carriage and machine bolts, and expansion lathe mandrels.

In closing his address Dr. Burgess emphasized that the standardization of machine tool elements and small tools offers a fertile field for contributions to national prosperity and economy. The machine tool industry has an effective trade organization known as the National Machine Tool Builders Association, he said, headed by R. E. Flanders, whom he characterized as one of the most useful members of the National Screw Thread Commission. The many difficult technical problems, said Dr. Burgess, were well appreciated by Mr. Flanders and his associates.

A report of the exhibits and abstracts of the papers presented at the technical sessions that followed will appear in THE IRON AGE of Sept. 25.

The Philadelphia & Reading Railroad Co. has adopted an increased operating schedule at its car shops at Pottsville, St. Clair and Schuylkill Haven, Pa., with 5-day week, 8-hr. day. The plants have been on a 4-day week basis for some time past.

STRUCTURAL STEEL BOOKINGS

August Volume Was 59 Per Cent of Capacity, Against 69 in July

WASHINGTON, Sept. 16.—Sales of fabricated structural steel in August amounted to 59 per cent of capacity, based on figures received by the Bureau of the Census from 154 of the principal fabricators. Total bookings reported by these firms with a capacity of 234,170 tons were 137,400 tons. Shipments of firms reporting this item represented 73 per cent of capacity as against 81 per cent in July. Computed tonnage booked in August was 153,400 tons, while computed shipments for that month were 189,800 tons.

Sales reported by 182 firms with a capacity of 243,880 tons were 167,564 tons, or 69 per cent of capacity in July. Computed tonnage booked that month was 179,400 tons, while computed shipments in July were 210,600 tons.

Considerable Increase in Week's Volume of Structural Awards

Structural steel awards increased considerably in the past week as compared with any one of several preceding weeks. The total was 30,056 tons, as reported to THE IRON AGE, this including two projects totaling 8500 tons in Chicago and one of 5000 tons in Philadelphia and a number of other jobs of 1000 tons or more each. Inquiry is not large, the total being 17,550 tons, of which 9000 tons is for subway construction in Philadelphia. Awards are:

Long Island Lighting Co., high tension towers for erection on Long Island, 250 tons, to Lehigh Structural Steel Co.
Textile Machine Works, Wyomissing, Pa., plant addition, 350 tons, to Lehigh Structural Steel Co.

Cuban power plants, 17 switch yard buildings, totaling 225 tons, to Lehigh Structural Steel Co.

Pennsylvania Tower & Light Co., towers for erection in Pennsylvania, 2500 tons, to Lehigh Structural Steel Co.

Erie Railroad, bridge, 375 tons, to American Bridge Co.

Hospital, Binghamton, N. Y., 500 tons, to Kellogg Structural Steel Co.

Eastern Malleable Iron Co., plant at New Britain, Conn., 350 tons, to unnamed fabricator.

Coal breaker at Frackville, Pa., 1000 tons, to unnamed fabricator.

American League baseball park at Philadelphia, grandstand, 1600 tons, to Belmont Iron Works.

State of Maryland, highway bridge at Oakland, 300 tons, to McClintic-Marshall Co.

French apartment building, Fifth Avenue, New York, 1200 tons, to Taylor-Fichter Steel Construction Co.

Apartment building, 316 West Seventy-second Street, New York, 1000 tons, to Hinkle Iron Works.

National Bible Institute, 330 West Fifty-fifth Street, New York, 800 tons, to Hay Foundry & Iron Works.

Loft building, 71-79 West Forty-fifth Street, New York, 1200 tons, to Levering & Garrigues Co.

Hospital, Englewood, N. J., 500 tons, to Eldlitz & Ross.

Apartment building, 953 Fifth Avenue, New York, 450 tons, to Bigelow & Nichols.

Narragansett Electric Co., Providence, R. I., addition, 1200 tons and 200 tons of plates, to Bancroft-Jones Corporation, Buffalo.

Boston & Albany Railroad, bridge at Palmer, Mass., 150 tons, to McClintic-Marshall Co.

Williston, Vt., bridge, 200 tons to Standard Engineering Co.

Sheffield, Mass., State highway bridge, 100 tons, to Lukes White, Inc., Boston.

Apartment house, Boston, 217 tons, to New England Structural Co.

Boston College, library building, 179 tons, to New England Structural Co.

School, Franklin, Mass., 134 tons, to New England Structural Co.

Morrison Hotel addition, Chicago, 5500 tons, to Duffin Iron Works.

Apartment house, 209 Lake Shore Drive, Chicago, 3000 tons, to Morava Construction Co.

Pacific Telephone & Telegraph Co., Prospect office building, Los Angeles, Cal., 527 tons, to Llewellyn Iron Works.

Hockey rink, Duluth, Minn., 136 tons, to American Bridge Co.

Two junior high schools, Des Moines, Iowa, 263 tons, to American Bridge Co.

Marquette University high school, Milwaukee, 450 tons, to Wisconsin Bridge & Iron Co.

Kenosha senior high school, Kenosha, Wis., 200 tons, to Worden-Allen Co.

Penn Athletic Club, Philadelphia, 5000 tons; general contract awarded to Thompson-Starrett Co., but award of steel not yet announced.

Cleveland Press, Cleveland, addition to newspaper plant, 200 tons, to Moss Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

City of New York, Public School No. 32, 400 tons.

Storage warehouse, 523 West Forty-second Street, New York, 600 tons.

Apartment building, 320 West Seventy-second Street, New York, 600 tons.

Garage, 312-318 West Twenty-sixth Street, New York, a few hundred tons.

Club building, 111-117 East Fifty-fourth Street, New York, about 500 tons.

Storage building, 214-232 West Twenty-sixth Street, New York, 500 tons.

New York Central Railroad, bridges, 800 tons.

Southern Railway, bridge, 150 tons.

Central Railroad of New Jersey, bridge, 150 tons.

Lehigh Valley Railroad, bridge, 350 tons.

Atlantic Coast Line, bridge, 200 tons.

Philadelphia Electric Co., through Stone & Webster, power plant at Philadelphia, 300 tons.

Mystic Iron Works, Boston and Everett, Mass., blast furnace, 1200 tons.

Wieboldt Store No. 3, Chicago, R. R. Wieboldt Co., general contractor.

Illinois Central, catenary bridges and trestles for suburban electrification, Chicago, 2500 tons, bids to be closed this week.

City of Philadelphia, Broad Street subway, second section, 9000 tons; bids close Oct. 21.

RAILROAD EQUIPMENT BUYING

Purchases of Cars to Date Now Nearly 100,000 and More Pending

Purchase by the Illinois Central of 6200 freight cars brings the total for the year almost to 100,000, and the total for this month is about 18,200. The Reading will probably buy 3000 cars this week, and with the Southern Railway inquiring for 3000, the outlook for continued railroad buying is fairly promising. Several thousand other cars are pending. The Southern is also asking for bids on 50 locomotives and locomotives ordered during the week numbered 41, of which 35 were bought by the Illinois Central.

The Southern Railway has inquired for 2500 box cars, 250 flat cars, 250 stock cars, 38 passenger cars and 50 locomotives.

The Illinois Central's order for 6200 freight cars was distributed as follows: 1000 gondolas each to the Western Car & Foundry Co., Pullman Car & Mfg. Co. and General-American Car Co., 500 gondolas each to the Mount Vernon Car Mfg. Co. and the Ryan Car Co.; 200 stock cars and 1000 box cars to the American Car & Foundry Co. and 1000 box cars to the Standard Steel Car Co.

The Gulf Coast Lines are inquiring for 1000 box cars and 250 gondolas.

The Illinois Central has ordered 25 Mountain type locomotives from the Lima Locomotive Works and 10 Mikado type from the Baldwin Locomotive Works.

The Detroit, Toledo & Ironton has ordered 6 freight locomotives from the Lima Locomotive Works.

The Chesapeake & Ohio Railroad has contracted with the American Locomotive Co. for the repair of 25 Mallet engines, each requiring about 15 to 20 tons of steel.

The St. Louis Southwestern has indefinitely postponed action on its inquiry for 1000 box cars.

The Great Northern is in the market for 600 steel underframes and has placed repairs on 300 box cars with the Siemens-Stembek Co.

The Great Northern Equipment Co. has awarded 20 50-ton 5000-gal. tank cars to the Standard Tank Car Co.

The Lehigh Valley has placed repairs on 300 hopper cars with the American Car & Foundry Co.

The Texas & Pacific is inquiring for 10 baggage and express cars.

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ESTABLISHED 1855

THE IRON AGE

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Canada's Depression in Steel

THE connection between the lower rates of duty now in force in Canada and the closing down of iron and steel plants there is being emphasized from time to time. *Iron and Steel of Canada*, referring to the fact that the entire blast furnace and steel plant of the British Empire Steel Corporation at Sydney, Nova Scotia, had been idle for weeks (one furnace and the bar and wire mills have now resumed), says that the suspension is only an illustration of the "disastrous effects which ever since the tariff was brought down have been creeping like a miasma over the horizon of Canadian industry." The editorial says further that since the new tariff became effective the United States Steel Corporation has dropped its plan for the building of a plant at Ojibway, Ontario, "for there is no longer need of it, and the Steel Corporation evidently thinks there will not be any need; it can undersell in this market from its plants in the United States."

When in May the British Empire Steel Corporation reduced its operations at Sydney and discontinued the production of foundry iron, the action was referred to in Canada as a result of the recent transfer to the free list of foreign-made products, including bars, rods and pig iron. Earlier in the year, also, the head of the Baldwin interests in Canada publicly stated that further tariff protection was needed to insure the reopening of the Baldwin Canadian Steel Corporation plant at Ashbridges Bay, Toronto.

It might be inferred from these pessimistic statements that exports of steel products from the United States to Canada have been steadily increasing. On the contrary there has been a substantial decline in recent months from the figures for the corresponding period in 1923. It is not so much, therefore, an increasing displacement of its domestic product by iron and steel imports that is troubling Canada just now as a lack of buying power, due in part to the depression in its agricultural districts. What is disturbing,

under such conditions, is that the percentage of falling off in consumption of iron and steel produced in Canadian plants is greater than the percentage of reduction in imports from the United States.

The theory on which Government bounties were paid to Canada's iron and steel producers, 15 and 20 years ago, was that in this way the industry would be built up into such robust strength that it would supply all the needs of the country. That expectation has not been realized and the vicissitudes of the leading Canadian steel companies have been many. The enormous increase in the capital requirements of diversified steel manufacture that has resulted from the technical and economic changes in the industry has been met in the United States only by consolidations having unparalleled financial and raw material resources. Canada, with her vast stretches of agricultural territory and her limited consumption of many forms of rolled steel, has not been able to support a steel industry covering more than a fraction of the products manufactured in this country. Whatever changes up or down are made in the tariff list from time to time, it may be expected that for years to come our neighbors on the north will draw a large portion of their finished steel supplies from the highly developed finishing mills of the United States.

Railroad Equipment Needs

OUR railroads have surprised many shippers and some of those companies which desire to sell them equipment by the seeming ease with which they have handled peaks of traffic movement in the last few years without increasing their rolling stock to the extent which some have deemed necessary.

Two and a half million cars are owned by all of the carriers and private car companies, and there has been no marked increase in this number in recent years, despite the claim that the normal growth of the country's freight traffic re-

quires an addition of about 5 per cent each year in freight carrying equipment. Fully 75,000 cars are scrapped each year through obsolescence and in the eight years since the war the railroads have bought scarcely sufficient new equipment to make up for this loss. Yet the carriers functioned almost without fault in handling the maximum car loadings of 1923.

Estimates as to the requirements of the railroads in new rolling stock may have to be revised. It is probable that these estimates are based on performances in freight carrying which do not match with the efficiency recently attained. With heavier locomotives that pull longer trains, with cars of larger capacity, and with the enforcement of regulations which to some extent have prevented unnecessary delays in the loading and unloading of cars by shippers, the railroads have managed even in peak traffic movements to obviate serious car shortages.

Car builders estimate that the railroads should buy not less than 200,000 cars a year during the next five years to bring their rolling stock up to the required standard of freight-moving capacity. But this is more cars than the railroads have bought in any year since the war, and it may well be that further improved efficiency in railroad management will curtail this estimated need considerably.

Cast Iron and the Microscope

OUR knowledge of cast iron has been greatly broadened of late by the application of the microscope. The structure of the metal is being analyzed with special reference to segregations, composition and thickness of section, and some valuable conclusions are being reached. An example of these results is found in an article on other pages, in which the author shows how segregations influence physical properties and points out the limitations of chemical analysis and fracture.

Some investigators are studying the application of the principles of heat treatment to gray iron. Still others have done work in the production of alloyed cast iron that is represented already in valuable forward steps. Also the use of the electric furnace in the refining, and even production, of gray iron has given a much improved product. If, now, the microscope should be applied to gray iron with only a fraction of the results attained with steel, our respect for the cruder metal might be increased materially.

A MEASURE of the depression in the British iron and steel industry is found in the slump in prices during the past five months, notably in the price of pig iron. Disregarding the exchange rate between dollar and pound sterling, the drop in No. 3 foundry iron has been from £4 15s. to £4 2s.; in basic, from £4 15s. to £4 2s. 6d.; in ferromanganese for export, from £17 to £13; in billets, from £8 to £7 10s.; in tin plate, from £1 4s. 3d. to £1 3s. 6d.; in black sheets, from £13 10s. to £13. These changes have been forced,

despite maintenance of labor and other costs, by sheer inability otherwise to compete with Continental prices.

Record Cement Consumption

FOR three successive months, June, July and August, shipments of Portland cement have made new monthly records, a fact of no small interest. In 1923 only one new monthly record was made. These heavy shipments were not attributable to a run of light shipments earlier in the year, for the eight-month total was 5 per cent above the corresponding total in 1923, which was a record year.

Some 15 to 20 years ago fears were felt in the steel industry that the rise of concrete construction would interfere with the growth of steel consumption; that concrete would in a measure "supplant" steel. It was not long, however, before it was seen that cement was really a coadjutor of steel, that it encouraged construction work and promoted a progress in which steel shared. As matters are now pretty well settled it is of interest to review the growth in the use of cement. As the growth of pig iron production is well known, and was considered marvelously rapid through the year 1916, a clearer idea is given by relating cement production to pig iron production.

The use of cement is recent only as the use of pig iron is recent. In the ten years 1850 to 1859, 1.72 barrels of cement were made per ton of pig iron. Twenty years later, from 1870 to 1879, only 1.01 barrels were made per ton of pig iron. By 1900 the proportion was 1.25 barrels per ton of pig iron, the proportion being less than that of a half century earlier.

In the ten years after 1900 there occurred the rapid rise in cement relative to pig iron. Almost every year the proportion rose, even though the production of pig iron was increasing rapidly. In 1910 there were made 2.84 barrels of cement to each ton of pig iron. The war stimulated pig iron much more than cement and that period may be skipped in our reckoning. In 1920 there were 2.71 barrels of cement per ton of pig iron, or a little less than in 1910. Then came a good sized jump, to 3.38 barrels of cement per ton of pig iron in 1923. A slightly higher proportion is altogether probable for the present year.

No direct comparison of values can be made, but it may be mentioned that the average value of cement as shipped in 1923 was \$1.90 per barrel, equivalent to about \$11.20 per gross ton, and that the 3.38 barrels per ton of pig iron were thus worth \$6.42. While the help that cement gives to steel is chiefly in facilitating construction and industrial progress, it is an interesting point that the production of concrete reinforcing bars in 1923 was 575,816 tons, or 2.2 per cent of the total rolled iron and steel. The weight of the 137,460,238 barrels of Portland cement produced in 1923 was about 23,000,000 gross tons.

Shipments of Portland cement in 1923, a new calendar year record, amounted to 135,912,118 barrels. The high month, a record at the time, was August, with 14,971,000 barrels. June of

this year broke that record, July broke the June record and August has since broken the July record by showing shipments of 16,855,000 barrels. Shipments in eight months have been as follows:

1922.....	76,240,000
1923.....	91,245,000
1924.....	95,965,000

Presumably the increase over last year is due largely to road building; but wherever the cement has gone it furnishes testimony that much work is being done this year.

Supply and Demand

IN economics, amid many controversies and differences of opinion, there is one great agreement. The quantity theory of money has been controversial for three centuries or more, some economists arguing that the quantity of money is a cause of other economic events while others argue that it is an effect. There is, however, no argument respecting supply and demand and their effect upon prices. It is a great natural law, akin to the law of gravitation, that when supply increases more than demand prices fall, and vice versa.

We need go no further in considering the subject of prices at the present time. Our general price level is high as compared with the pre-war, but it is not equally high in all respects, or even approximately equal. The cost of houses, for example, is considerably higher today than the general index of price level, while the prices for raw materials in general are lower. Among raw materials there are wide divergencies. The prices for copper and rubber are relatively low, even by comparison with the pre-war prices, while prices for lead and tin are relatively high. The prices for wheat and corn last year were rather low; this year they have become rather high.

These differences and shifts are obviously explainable by conditions of supply and demand. Increased production caused the supply of copper and rubber to outrun the demand. Oppositely with lead and tin. The rise in wheat this year is ascribable to shortage of the world's crop and to nothing else.

High rents are ascribable to shortage of houses. A landlord who owns a house in a town where there is a great demand for houses commands a rental in tune with the market for houses in that place, regardless of what his house cost. It may have been built under pre-war conditions and its value may have been written up, but that cuts no figure. Another landlord owns a house in a place where there is a slack demand for accommodations and is able to get only a pre-war rental, or perhaps not even that.

Why, then, do not such discrepancies correct themselves? Obviously it is owing to economic maladjustments and restrictions. In places where rents are high more houses should be built, and if enough of them were built rents would come down. A reason why that does not happen, or not so quickly as might be expected, is that we lack the men wherewith to do the work, and if we do not conform to all of the exactions of the limited number they refuse to work at all. If men

who have become idle in other industries evince a wish to find occupation as builders the existing body of builders endeavors to prevent them and in certain parts of this country they are able to make the exclusion effective.

All of such conditions reflect economic unbalance. In some industries we have more work being done than is needful, and consequently low prices. In other industries not enough work, and consequently high prices. Diversions arise out of popular wishes, which may not always be wise. The farmer likes to have his automobile and diverts a large number of workers to the fulfillment of his wishes, creating special demands that lead to a whole string of high prices. For the sake of this he neglects the fertility of his farm and the fertilizer industry feels the consequences in low prices.

Thus it is with our domestic economy. We have the same thing on a larger scale in the international economy. By economic restrictions we obstruct the operation of the principle of the international division of labor. There are some things that one country can do best, and other things that are best done by another. There are some things that it would be preposterous to think of obstructing. The United States requires an immense quantity of rubber, but we do not think of trying to raise it here. Rather do we get it from the East Indies and Brazil, where it can be produced much more advantageously.

On the other hand, we are unwilling to consider that if Europe could furnish us with clothing more cheaply than we can make it ourselves we should advantageously let Europe do it and divert our work to doing for Europe the things that we can do more economically. This causes us to see at the present time millions of workers unemployed in Europe who might be working for us.

The real reason for high prices is insufficiency of production; i.e., a supply that is not commensurate with the demand. When that condition is corrected we shall see a tendency for prices to fall. The present derangement, which is a consequence of the war, is too great, however, to be corrected with rapidity. Correction may require the time of a generation or more. At the present time in individual industries we have low prices where there is a sufficiency of production and high prices where there is an insufficiency. The common sense of mercantilism, dismissing all academic conjectures and hypotheses, knows that this is so, and must always be so, by reason of the great natural law of supply and demand.

CORRESPONDENCE

American Participation in London's Shipping and Machinery Exposition

To the Editor: You may be aware that during the past 20 years there has been held at various intervals in London a series of shipping, engineering and machinery exhibitions at which the manufacturers of all nations have been represented. Although the largest exhibition building in England always has been secured, it has been a matter of regret that the limitations of space have prevented adequate representation

of America. This handicap, however, no longer exists, a 50 per cent extension of the exhibition building known as Olympia recently having been made which gives a very considerably increased area for the display of exhibits from other nations.

On the occasion of the last Shipping, Engineering and Machinery Exhibition, a banquet was given to overseas visitors, and in replying to the toast "Our Visitors," Frederick D. Herbert, president of the Kearfott Engineering Co., Inc., New York, expressed the hope that at the next exhibition an opportunity could be afforded to American firms engaged or connected with the shipping, shipbuilding, engineering and machinery industries to participate in what he described as "this magnificent exhibition" to a very much greater extent than hitherto, as he felt certain that this would be to the benefit of every one concerned.

It has been arranged that the next exhibition shall be held from Nov. 23 to Dec. 5, 1925, under the presidency of the Hon. Sir Charles Parsons. The president, chairman and members of the honorary committee of experts will be delighted to have a thoroughly representative display of the latest and most approved specialties on the American market, and therefore have decided to devote a certain portion of the building to an American section, which it is hoped may eclipse in every way the very fine Holland section at the 1919 exhibition.

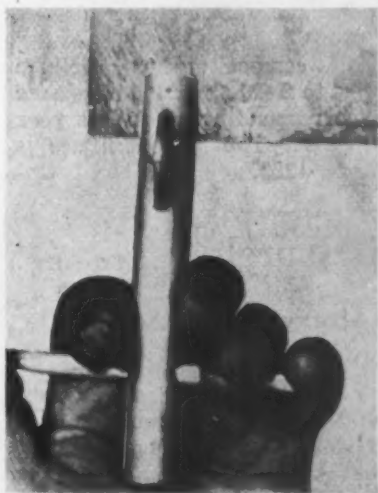
With a view to affording all possible information to firms interested in the project, I have arranged to spend some considerable time in the United States during the coming fall. I expect to reach New York about the middle of October, and if those of your readers who are interested in export trade, not only with the United Kingdom but with all other parts of the world (the shipping exhibition being attended by buyers from every part of the globe) will be good enough to send me a note to your care, I shall be delighted to furnish either personally or by mail all possible information on the subject of the exhibition.

F. W. BRIDGES,
General Manager.

London, England, Sept. 1.

Handling Sheet Metal

To the Editor: It is not always safe to handle sheet metal with gloved hands. The edges may be roughened to such an extent that they may cut through



Tool for Handling Sheet Metal without Danger of Slipping or of Cutting or Tearing the Hand.

the leather, especially if the hands slip over the material. Pliers are often used but they are not really satisfactory because of their liability to slip. A good tool to use when it is necessary to pull a sheet of metal more or less vigorously is shown in the accompanying illustration. This was devised in an Eastern shop to facilitate pulling metal sheets through a cutting machine.

The device consists of a length of round steel with a slot cut in the end about 1 in. long. This slot is wide enough to take various thicknesses of metal. A hole is drilled on one side of the slot and a similar hole a short

distance up the rod; this latter hole being drilled to about the center. Between these holes a smaller hole is drilled right through. These three holes receive the clamping arrangement, which consists of a piece of drill rod bent double with one end pointed sharp and an eye screw with a thumb nut on the other side. In use the slot is slipped over the edge of the sheet and the thumb nut (not shown) tightened. It is impossible to pull this tool off when tightened, as the point on the clamp makes a slight dent.

HARRY MOORE.

Montreal, Que.

New Books Received

The Tax Problem in Wisconsin. First of a series of studies of practical tax problems, published by the National Industrial Conference Board, 247 Park Avenue, New York. Pages, 163; tables, 37. Price, \$2.50.

The Science of Metals. By Zay Jeffries and Robert S. Archer. Pages, xvii + 460; charts, tables, illustrations, 190. Published by McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, \$5.

Coal Carbonization. American Chemical Society Monograph Series. By Horace C. Porter. Pages 431, 6 x 9 in.; charts, illustrations, 175; tables, 61. Published by the Chemical Catalog Co., Inc., 19 East Twenty-fourth Street, New York. Price, \$6.

The Causes of Industrial Unrest. By John A. Fitch. Pages XIV + 424, 5 1/4 x 8 in. Published by Harper & Brothers, 49 East Thirty-third Street, New York. Price, \$3.

Engineering in American Industry. By Conrad Newton Lauer. Pages 94, 9 x 12 in. profusely illustrated, charts 32. Published by the McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, \$2.50.

Heating and Ventilating Guide, 1924-1925. Pages 458 + 52, 6 x 9 in.; charts, tables, photographs and roll of membership. Compiled and published by the American Society of Heating and Ventilating Engineers, 29 West Thirty-ninth Street, New York. Price, \$3.

Elasticity and Strength. Section V. Economic theory of steel railroad bridge design. By C. A. P. Turner. Pages 129, 6 x 9 1/4 in. Profusely illustrated, with charts and tables. Published C. A. P. Turner, Minneapolis. Price, \$5.

The Iron Age and Its Readers

MORE and more subscribers to THE IRON AGE are finding it to their advantage to have bound volumes on hand.

A few days ago a subscriber who had been in the habit of keeping the back numbers of THE IRON AGE, but had not bound them, found it necessary to come to this office to consult an article published a year or two ago. His company had kept the numbers for years, but they took a great deal of space and had never been bound. Recently the company moved to another building and decided not to take the old numbers along. "We thought we knew all that was worth knowing in the old copies of THE IRON AGE," he said, "but we found we were mistaken."

The point is that if the copies had been bound very much less space would have been occupied and a valuable source of information would have been constantly at hand for reference.

Iron and Steel Markets

STIMULUS OF LOW PRICES

Recent Concessions Brought Out Car Orders

Current Operations Close to 60 Per Cent—Pig Iron Stocks Somewhat Less

With steel works operations at practically the same rate as for last week, or not far from 60 per cent for the country, there are varying reports as to new business apart from railroad demand. Chicago, as the chief center of railroad activity, finds most encouragement. Pittsburgh and Eastern steel companies qualify their optimism, indicating that September buying has been somewhat below expectations.

In the heavier finished products attention has centered on the lower prices some producers have named in the past 10 days to stimulate buying and maintain the recent scale of operations. There is evidence that Pittsburgh mills have become more aggressive in certain districts, also that some consumers have been freer buyers at concessions.

A few more steel company blast furnaces are starting up, indicating the confidence of producers that steel production will hold up to the August rate at least. Two or three merchant furnaces are about to resume also.

An advance of \$1 to \$1.50 in steel scrap under moderate buying at Pittsburgh has not been paralleled in other districts, and there are indications that the recent effort to make scrap a gage of the general market has been overdone.

Purchase by the Illinois Central of 6200 freight cars brings the 1924 total close to 100,000. The Reading will probably buy 3000 cars this week and the Gulf Coast Lines is taking bids on 1250. The Southern Railway has inquired for 3000, also for 50 locomotives. Of 41 locomotives placed in the week, 35 were for the Illinois Central.

The Illinois Central has divided 60,000 tons of rails for the first half of next year among Chicago and Alabama mills. The Reading order will be for 15,000 to 20,000 tons. Reports of large Pennsylvania Railroad requirements, are taken with allowance, since it has not yet specified fully on its last purchases.

Structural steel awards of the week were more than 30,000 tons, or about double the rate of several preceding weeks. Two Chicago projects account for 8500 tons and one in Philadelphia for 5000 tons. Of 17,500 tons of new work in the market, 9000 tons is for subway construction in Philadelphia.

Bookings of fabricated steel fell off from 69 per cent of capacity in July to 59 per cent in August, but the total for the eight months of this year was 1,388,000 tons, or 5000 tons more than for the same period of 1923.

The bulk of current demand for plates is coming from railroad car builders. Competition among plate mills is such that none can go far afield for business. The Pennsylvania Railroad order for 10,000 cars seems to have been due more to the low bids made by the builders and the exceptionally

low prices at which the steel was bought, than to a pressing need for additional rolling stock. One car plant was about to shut down when its share of this order came.

The trend of sheet prices appears in the reduction of 3 per cent in the wages of tonnage men in union mills, effective Sept. 1. On shipments in July and August the average price for Nos. 26, 27 and 28 black sheets was 3.50c. as against 3.60c. for May and June.

Steel barrel manufacturers who came into the market for round lots of black sheets bought in some cases at \$4 a ton below what has been considered minimum, though the usual range is 3.40c. to 3.50c.

The pig iron market is improving and some fairly large tonnages have been bought by important companies, but furnaces still find it difficult to advance quotations and production is not expected to increase greatly at present price levels. Buying by foundries making castings for railroads is a feature. One sale of 5000 tons of basic was for river shipment from Ironton, Ohio. The recent buying movement in ferromanganese has put fully 30,000 tons on the books of domestic and foreign producers, a good part of it on the basis of \$92.50 and in some cases \$90.

American Pig Iron Association reports of stocks of iron on the yards of the merchant furnace companies reporting were 1,001,612 tons, as compared with 1,052,898 tons on July 31. Counting in merchant iron held by steel companies which sell pig iron, the total on Aug. 31 was 1,194,652 tons, against 1,262,864 tons on July 31. Unfilled orders were 873,979 tons on Aug. 31, or 83,118 tons more than at the close of July.

On pig iron THE IRON AGE composite price has been at \$19.46 for five weeks. One year ago it was \$25.04; two years ago, \$32.54, the highest figure since 1920.

The finished steel composite has declined slightly, or from 2.496c. to 2.481c. per lb., compared with 2.775c. for the corresponding week last year and 2.419c. two years ago. The present figure is the lowest since January, 1923.

Pittsburgh

Sharp Advance in Heavy Melting Scrap—Pig Iron Still Dull

PITTSBURGH, Sept. 16.—Aside from a sharp advance in scrap prices, which has carried heavy melting steel \$1.50 to \$2 a ton above recent levels in this district and incidentally carried the delivered price on some sales above the furnace base of basic iron for the second time this year, spectacular developments in the iron and steel situation are lacking. Reports about steel business vary considerably both as to the experiences of the different companies and the different products. Taken as a whole, the volume of orders is pretty well up to the recent average, but the preponderance is on the side of releases against old orders as distinct from strictly new business. In a broad way, interest of buyers appears to have slackened somewhat this month as compared with last month, particularly as compared with the last two weeks of last month. Fresh price

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
No. 2X, Philadelphia...	\$21.76	\$21.76	\$21.26	\$26.26
No. 2, Valley Furnace...	20.00	20.00	19.00	25.00
No. 2, Southern, Cin'ti...	21.55	21.55	21.55	26.05
No. 2, Birmingham, Ala.†	17.50	17.50	17.50	22.00
No. 2 foundry, Chicago*	20.50	20.50	20.50	27.00
Basic, del'd, eastern Pa...	20.00	20.00	20.00	25.00
Basic, Valley furnace...	19.00	19.00	19.00	25.00
Valley Bessemer, del. P'gh.	21.76	21.76	21.76	28.26
Malleable, Chicago*	20.50	20.50	20.50	27.00
Malleable, Valley	20.00	20.00	19.00	24.50
Gray forge, Pittsburgh...	21.26	21.26	20.26	25.76
L. S. charcoal, Chicago...	29.04	29.04	29.04	32.15
Ferromanganese, furnace...	95.00	95.00	99.00	110.00

Rails, Billets, etc., Per Gross Ton:	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	36.00	37.00	38.00	42.50
O.-h. billets, Pittsburgh...	36.00	37.00	38.00	42.50
O.-h. sheet bars, P'gh...	37.00	37.50	38.00	42.50
Forging billets, base, P'gh.	42.00	42.00	43.00	47.50
O.-h. billets, Phila...	42.17	42.17	43.17	47.67
Wire rods, Pittsburgh...	46.00	46.00	46.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb...	2.00	2.00	2.00	2.40
Light rails at mill...	1.85	1.85	1.85	2.15

Finished Iron and Steel,	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.32	2.32	2.42	2.67
Iron bars, Chicago...	2.15	2.15	2.20	2.40
Steel bars, Pittsburgh...	2.00	2.10	2.15	2.40
Steel bars, Chicago...	2.00	2.00	2.15	2.50
Steel bars, New York...	2.34	2.44	2.49	2.74
Tank plates, Pittsburgh...	1.80	1.80	2.00	2.50
Tank plates, Chicago...	2.10	2.10	2.25	2.60
Tank plates, New York...	1.94	1.99	2.09	2.84
Beams, Pittsburgh...	2.00	2.00	2.00	2.50
Beams, Chicago...	2.10	2.10	2.25	2.60
Beams, New York...	2.24	2.34	2.34	2.84
Steel hoops, Pittsburgh...	2.60	2.60	2.60	3.15

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

Sheets, Nails and Wire,	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.50	3.50	3.40	3.75
Sheets, galv., No. 28, P'gh.	4.60	4.60	4.50	5.00
Sheets, blue an'd, 9 & 10	2.70	2.70	2.60	3.00
Wire nails, Pittsburgh...	2.80	2.80	2.80	3.00
Plain wire, Pittsburgh...	2.55	2.55	2.55	2.75
Barbed wire, galv., P'gh...	3.50	3.50	3.50	3.80
Tin plate, 100-lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
Carwheels, Chicago...	\$18.50	\$18.00	\$17.00	\$20.00
Carwheels, Philadelphia...	18.00	18.00	17.50	21.00
Heavy steel scrap, P'gh...	19.00	17.50	17.50	18.00
Heavy steel scrap, Phila...	17.50	17.00	17.00	16.50
Heavy steel scrap, Ch'go...	16.50	16.50	15.50	16.25
No. 1 cast, Pittsburgh...	18.00	18.00	18.00	22.00
No. 1 cast, Philadelphia...	18.00	18.00	17.00	21.50
No. 1 cast, Ch'go (net ton)	18.50	18.50	17.50	20.00
No. 1 RR. wrot. Phila...	19.00	19.00	18.00	20.00
No. 1 RR. wrot. Ch'go (net)	15.00	15.00	13.75	15.50

Coke, Connellsville,	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
Per Net Ton at Oven:				
Furnace coke, prompt...	\$3.00	\$3.00	\$3.00	\$4.25
Foundry coke, prompt...	4.00	4.00	4.00	5.25

Metals,	Sept. 16, 1924	Sept. 9, 1924	Aug. 12, 1924	Sept. 18, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.50	13.50	13.75 1/2	14.00
Electrolytic copper, refinery	13.00	13.12 1/2	13.37 1/2	13.37 1/2
Zinc, St. Louis...	6.25	6.15	6.17 1/2	6.45
Zinc, New York...	6.00	6.50	6.52 1/2	6.80
Lead, St. Louis...	7.95	7.95	7.60	6.80
Lead, New York...	8.10	8.10	7.87 1/2	7.12 1/2
Tin (Straits), New York...	47.00	51.12 1/2	51.62 1/2	41.50
Antimony (Asiatic), N. Y.	11.00	11.00	9.12 1/2	7.50

THE IRON AGE Composite Prices

Sept. 16, 1924, Finished Steel, 2.481c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	Sept. 9, 1924, 2.496c. Aug. 19, 1924, 2.510c. Sept. 18, 1923, 2.775c. 10-year pre-war average, 1.689c.
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Sept. 16, 1924, Pig Iron, \$19.46 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	Sept. 9, 1924, \$19.46 Aug. 19, 1924, 19.46 Sept. 18, 1923, 25.04 10-year pre-war average, 15.72
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1924 to Date	1923
High 2.789c., Jan. 15.....	High 2.824c., April 24.....
Low 2.288c., Feb. 26.....	Low 2.446c., Jan. 2
	20.77, Nov. 20

declines in the heavy tonnage products reflect the lighter buying and the desire of mills to secure enough business to maintain operating schedules.

Strictly within the area in which Pittsburgh mills have a freight advantage over outside mills, the prevailing prices are 1.90c. for plates, 2c. for shapes and 2.10c. base for steel bars, but Pittsburgh mills cannot go beyond this area and get business at these prices and there is no doubt that they are going beyond the natural territory for orders. Cold-finished steel bars have dropped \$2 a ton since a week ago, and in other products with the exception of pipe and tin plate real price firmness is absent.

Arriving at an estimate of the current rate of ingot production still is difficult, because practically none of

the independent companies has any back log business and the Steel Corporation is not abundantly endowed with live business of this sort. Steel works operations consequently depend upon current orders and lately the orders have been good one day and poor the next. Some plants are gaging production by orders, while some are producing in excess of orders and stocking the surplus. Current rate of production in this and nearby districts is probably between 60 and 65 per cent of capacity. The Carnegie Steel Co. has ordered into blast one of its Ohio furnaces at Youngstown. The addition of this stack would give that interest 28 furnaces in out of a total of 58. Activity still is lacking in the pig iron market and prices are no more than steady. An interesting condition is created by the fact that the price

of scrap again is at or above the furnace price of basic pig iron and if the advance in scrap is sustained, it probably would result in a heavier melt of pig iron as the cheaper material. Such an expectation early this year, however, was not realized because scrap failed to hold. The circumstances surrounding the latest advance in scrap are such as to indicate that the market will not hold unless a substantial increase in steel orders renders necessary heavy scrap purchases.

A better demand for coal has not strengthened prices and real strength also is lacking in the coke market.

Pig Iron.—Business still drags in this market and prices find their basis only in very small tonnages. None of the users of the steel making grades appears to be in need of supplies and the larger users of foundry iron some time ago covered their fourth quarter requirements to a large extent. The American Brake Shoe & Foundry Co. put out an inquiry for 7000 tons of foundry iron for delivery over the last quarter. Of this total 2400 tons is wanted for local plants, 1200 tons for Cleveland and the remainder for eastern plants of this company. We note one sale of 300 tons of Bessemer iron at \$20, Valley furnace, to a Pittsburgh maker of rolling mills, which also paid the same price for 200 tons of No. 2 foundry. Other small sales of Valley foundry iron have been made at \$20 for the base grade, but there are fair sized stocks of this kind of iron in the hands of middlemen which could be sold at a profit at less than \$20 and an order of attractive size would probably bring out a price of \$19.50 from one Valley furnace interest. A local car company is a recent buyer of 500 tons of malleable iron at a price of \$20.39 delivered. Valley furnaces continue to quote \$20 on this grade, but in view of this sale it becomes merely an asking price, although it is believed that the seller now has little of this iron left. Cherry Valley furnace, Leetonia, Ohio, will be blown out about the end of the month, but the Dover furnace, Dover, Ohio, owned by the same company, will be relighted about the same time. Mattie furnace, A. M. Byers Co., Girard, Ohio, is expected to be blown in about the middle of October.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$19.00 to \$20.00
Bessemer	20.00 to 21.00
Gray forge	19.50
No. 2 foundry	20.00
No. 3 foundry	19.50
Malleable	20.00
Low phosphorus, copper free....	27.00 to 28.00

Ferroalloys.—The leading domestic commercial producer of ferromanganese, which recently advanced the price to \$100, Atlantic seaboard base, has made no sales in this territory at that figure. As a matter of fact, consumers generally covered at \$95 down to \$90 and interest in further supplies is limited at the moment. Just what price a real inquiry would bring out is conjectural, but British producers generally are quoting \$95, c.i.f. Atlantic seaboard, duty paid for account of buyer. With the domestic quotation \$100, the market based on asking prices is quotable from \$95 to \$100, but there have been no recent sales here to sustain either quotation. Of course, no sales are possible at the higher figure so long as material is available at \$95. Common quotations on 20 per cent spiegeleisen are from \$32 to \$33, furnace, for domestic material, but the lower price was shaded on a recent sale of 2000 tons and again on an inquiry for 500 tons. There is no change in 50 per cent ferrosilicon prices; one small producer still is quoting \$72, delivered, and even a quotation of 50c. a ton more lost a recent order for a carload in this territory. Prices are given on page 735.

Semi-Finished Steel.—Fair sized sales have been made lately, which have served to more clearly define prices than had been possible. We note sales of 4-in. billets at \$36, and there also have been sales of slabs at the same figure, while sheet bars have sold at \$37. Some makers still are quoting \$1 a ton above these levels and there are deliveries against third quarter contracts which carry the higher prices. For prompt delivery, however, the lower figures are the more common ones and more representative of today's possibilities. One lot of 5000 tons of sheet bars for last quarter

delivery is noted at \$36.50, Pittsburgh, but the giving of specifications against some unshipped tonnage was part of the bargain in the new sale. None of the other makers is willing to cut \$37 on sheet bars. Forging billets are quoted anywhere from \$41 to \$42 with the latter the prevailing price. Only small lots of wire rods are moving, and these usually are \$46, base. There are no big open market demands for skelp from makers of tubular goods, and the price is purely nominal. Prices are given on page 735.

Wire Products.—Business is just about holding the gain rolled up in August. Buying still is almost entirely for immediate requirements and as yet does not include much barbed wire or fence, call for which still is limited. Mills have succeeded in reducing their stocks appreciably as a result of the greater demands of the past 60 days, but there also has been a speeding up of production and very prompt deliveries are being made on orders. We find the industry as a whole about 60 per cent engaged, but with almost no backlog business. Prices are not absolutely rigid at the published levels in all districts, but deviations are not common. The trade is interested in what plan of quoting wire products will be adopted in the event that the Steel Corporation decides to abide by the Federal Trade Commission's "cease and desist" order. Prices are given on page 734.

Steel Rails.—On the bulk of the orders that are coming out for light rails, which are entirely for small lots, prices range from 1.85c. to 1.90c., base, mill, for billet rails. It is admitted that less has been done on one or two sizable lots, but prices brought out by good-sized lots are not common. Prices are given on page 734.

Tubular Goods.—While there continues to be a fairly good and steady demand for standard pipe, the fact that there is only a moderate business in oil and gas well goods and that line pipe orders are falling behind shipments is making it a little difficult for mills to maintain the recent rate of operations of about 75 per cent of capacity. There is no disposition among jobbers to anticipate their needs, since signs of an advance in prices are not distinct. The boiler tube situation is helped slightly by recent locomotive orders, but prices still are easy, with lapwelded steel tubes openly quoted at 5, 5 and 2½ per cent beyond the card and charcoal iron tubes at 5, 5 and 5 per cent beyond the card. Commercial seamless tubes are quoted 3 points above the card discounts. All quotations are subject to further concessions. Discounts are given on page 734.

Sheets.—This month's business is not maintaining the August rate of increase and the effort to maintain operating schedules is attended by fresh irregularity in prices. Observance of 3.50c., base, for black, 4.60c., base, for galvanized and 2.70c., base, for blue annealed is consistent among the larger producers, but the smaller units are naming prices at least \$2 per ton less, and in one case recently, where 1400 tons of black sheets was involved, it is reported that the mill getting the order went to 3.30c. August operations of independent mills were slightly more than 65 per cent; the present rate is close to that point. The leading interest also is operating at about 65 per cent, making that the rate of the industry as a whole. Prices are given on page 734.

Tin Plate.—The condition of overproduction or of under consumption, according to the viewpoint, of tin plate for packers' cans in the first half of the year is being corrected by the fact that container manufacturers are fairly free with specifications and mill accumulations are dwindling. There is enough new business to sustain an average rate of operation of about 50 per cent of capacity. There is no change in the price on domestic business and no suggestions that one is immediately ahead.

Cold-Finished Steel Bars and Shafting.—Drop to 2c., base, Chicago, for hot-rolled bars was followed by a drop to 2.70c., base, Chicago for cold-finished steel bars. Pittsburgh makers of the latter have met that price and now are quoting 2.70c., base, Pittsburgh. This represents a drop of \$2 per ton, but is compensated for by a like decline in hot-rolled bars at Pittsburgh. No change yet has been made in ground shafting, which holds at 3.20c., base, f.o.b. mill, for lots of a carload or more.

Hot-Rolled Flats.—Price conditions show little change. In the hoop sizes the market is fairly firm at 2.60c., base, and bands do not often sell at less than 2.40c., but on wide material, due to the fact that so many types of mills can be used in its production, competition for orders is keen and prices are in keeping with that situation. It is difficult to quote representative prices, because of the employment of the net price method when attractive orders are presented. Prices are given on page 734.

Cold-Rolled Strips.—While 4.25c., base, still is called the regular market price by some makers, an increasing number of mills are naming 4c., and in most sections of the country and on most of the current business the latter is the prevailing price.

Track Supplies.—Business is better in the prospective than in the actual. Recent quotations are holding, but they are untested and probably would be cut if a worthwhile order was presented. Prices are given on page 734.

Iron and Steel Bars.—In this immediate district 2.10c., base, is the ruling price on steel bars, and it is claimed that some sales have been made as high as 2.15c., but local mills are known to have gone as low as 2c., base, in other districts, and there are unverified reports that this price also has appeared in some places in the Pittsburgh area. Reports about business vary considerably, with some makers doing better than they did recently, while with others incoming specifications and orders are lighter than they were recently. Increased railroad buying of cars has brought a better demand for iron bars, but no change in prices. Prices are given on page 734.

Structural Material.—The market has pretty well settled to 2c., Pittsburgh, on all but small lot inquiries, which it is claimed still are being booked at 2.10c. Structural lettings are fewer with local shops than they were recently, and new inquiries also are less frequent, although it is stated that a good deal of tonnage is represented in pending business. Price competition on fabricated steel still is pretty sharp. Plain material prices are given on page 734.

Plates.—The price of 2c., Pittsburgh, has not entirely disappeared in this district, but it is a pretty small tonnage that will not bring out a quotation of 1.90c. and local mills have gone to 1.80c., Pittsburgh, in seeking orders outside the zone within which Pittsburgh mills have a freight advantage. The situation is not a satisfactory one from either the demand or price standpoint, particularly the latter, as 1.90c. is claimed to be below the cost line. Prices are given on page 734.

Bolts, Nuts and Rivets.—Recent price advances are held with considerable firmness and business is better than it would be if the recent uncertainty as to prices had continued. Prices and discounts are given on page 734.

Coke and Coal.—Most of the blast furnaces now in blast or likely to be during the last quarter of the year are covered against coke requirements and the contract market now is very dull. Most of the tonnage booked was at \$3.25 per net ton at ovens for beehive oven coke, but there was at least one contract which was placed at \$3.20 and one furnace which will be operated on by-product coke will get supplies at the equivalent of \$3, Connellsville. Although production is being held pretty close to contract requirements, spot offerings are ample for the demand and are readily available at \$3. Spot foundry coke still ranges from \$4 to \$4.50. The coal market shows a fair degree of life but prices still are easy. Mine run steam coal ranges from \$1.50 to \$2.10 per net ton at mines. Coking grade from \$1.60 to \$1.85 and gas coal from \$2 to \$2.25. Steam slack is a little more plentiful and slightly easier in price, ranging from \$1.15 to \$1.25, but gas slack is scarce and firm at \$1.40 to \$1.50.

Old Material.—It was intimated in these columns recently that the available supply of scrap was so small that if a Pittsburgh district mill came into the market for a round tonnage prices would rise sharply. This happened in the past week, purchases for Steubenville, Ohio, and Midland, Pa., resulting in an advance

of \$1.50 to \$2 per ton in heavy melting grade over the prices of a week ago. Only small purchases were made for the latter delivery, but for the former point the takings are estimated as high as 10,000 tons, and the materials being for delivery in two weeks to 30 days, as high as \$20 was paid for a part of the tonnage. Sales have been made from \$19 to \$20 and that is the quotable range this week, although it is doubtful whether the prices could be immediately repeated in view of the fact that the buyers now are out of the market and other users in the district do not appear to be in need of supplies. Warren, Ohio, also has paid \$20 for heavy melting steel and in the general Youngstown district \$19 appears to be as low as any sales of that grade recently have been made. At \$20, heavy melting steel for the second time this year has crossed the furnace base of basic pig iron.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel.....	\$19.00 to \$20.00	
No. 1 cast, cupola size.....	18.00 to 18.50	
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.50 to 20.50	
Compressed sheet steel	17.25 to 17.75	
Bundled sheets, sides and ends..	15.50 to 16.00	
Railroad knuckles and couplers..	21.50 to 22.50	
Railroad coil and leaf spring....	21.50 to 22.50	
Low phosphorus blooms and billet ends	23.00 to 23.50	
Low phosphorus plate and other material	22.00 to 22.50	
Railroad malleable	16.50 to 17.00	
Steel car axles	23.00 to 23.50	
Cast iron wheels	18.50 to 19.50	
Rolled steel wheels	21.50 to 22.50	
Machine shop turnings.....	14.50 to 15.00	
Sheet bar crops	22.00 to 22.50	
Heavy steel axle turnings	15.50 to 16.00	
Short shoveling turnings.....	15.00	
Heavy breakable cast.....	16.00 to 16.50	
Stove plate	15.00 to 15.50	
Cast iron borings.....	15.00	
No. 1 railroad wrought.....	16.50 to 17.00	
No. 2 railroad wrought.....	19.00 to 20.00	

Merchant Pig Iron Stocks on Aug. 31

The monthly report of the American Pig Iron Association for August shows that stocks of iron on the yards of merchant furnace companies reporting, as of Aug. 31, were 1,001,612 tons, as compared with 1,052,898 tons on July 31. Stocks of merchant iron on steel company's yards so far as reported were 193,040 tons on Aug. 31, against 209,966 tons one month before. Total stocks on Aug. 31 were 1,194,652 tons, while unfilled orders were 873,979 tons, leaving unsold stocks of 320,673 tons. Total stocks on July 31 were 1,262,864 tons, while unfilled orders as of that date were 790,861 tons, leaving unsold stocks at 472,003 tons. August, therefore, showed a net decrease of 151,330 tons.

A. M. Castle & Co., iron and steel jobbers and mill representatives, Chicago, have purchased the Berger & Carter Co., San Francisco, large jobber on the Pacific Coast. The firm of Berger & Carter was organized in 1902 and has enjoyed a steady growth in business. In 1918 the Castle company bought the Western Iron & Metal Co. at Seattle, and it is now equipped to handle a large Western trade from its Seattle and San Francisco warehouses.

The Studebaker Corporation, South Bend, Ind., is perfecting plans for an early increase in operations at its local automobile plant, and expects to develop a full capacity schedule during October. The working force will be advanced from the present quota of 14,500 to 18,000 men.

The National Iron Works, 710 Windsor Street, Hartford, Conn., plant has been sold to the Crane Co., Chicago, which will utilize the property as a distributing depot. The National Iron Works retains manufacturing equipment and will build elsewhere later.

Chicago

Railroad Buying Still Features the Improving Market Conditions

CHICAGO, Sept. 16.—Railroad buying of both rails and freight cars is the outstanding feature of an improving market. Orders placed by the Illinois Central include 60,000 tons of rails for 1925 delivery and 6200 cars, involving 68,000 tons of steel. The Gulf Coast Lines has issued inquiries for 1250 cars, but the recent report that the St. Louis-San Francisco would buy several thousand cars is now denied.

Not alone the railroads but practically all classes of steel consumers are coming into the market for more tonnage. Mill bookings are steadily increasing; yet there is little, if any, speculative buying and most orders cover actual current needs, thereby reflecting expanding steel consumption.

A leading producer whose August business was 28 per cent heavier than that for July is confident that the increase for September over August will prove twice as large. Notwithstanding the more favorable outlook, caution has not been abandoned as the guiding policy of purchasing agents, and least of all by the farm implement makers who have suffered three years of lean business. Larger orders of both steel and pig iron, however, are convincing proof of betterment in that industry. In fact, an implement manufacturer who recently bought pig iron is again in the market for 3300 tons of foundry grades.

A recovery in automobile production is also making itself felt. The Interstate Iron & Steel Co., a manufacturer of alloy steel largely used in the automotive industry, is now operating all five of its open-hearth furnaces. Operations of other mills are also improving, the leading independent being on a 70 per cent basis, while another large interest has increased its output from 45 to 50 per cent of capacity.

Due to the blowing in of another blast furnace at Gary, the number of active steel works stacks has been increased to 16 out of a total of 34 in the district. Another merchant blast furnace is scheduled to blow in tomorrow. The best that can be said of finished steel prices is that they are no weaker than heretofore. In some instances, notably in the case of soft steel bars, efforts to stiffen prices have met with some success.

Pig Iron.—Local iron remains on a double price basis, one producer asking \$21 base furnace while another continues to quote \$20.50. Although some tonnage has been placed at the higher figure, the great bulk of current business is moving at the old price. Outside of a few large transactions, it can not be said that buying is generally active. Shipments against contracts, however, are increasingly heavy; in fact, so large as to warrant another expansion in production. A second Iroquois furnace will be lighted tomorrow, increasing the number of active merchant stacks to three out of a total of 13 in the Chicago, Milwaukee and Duluth districts. Delay in completing improvements to the Zenith Furnace, Duluth, will prevent that stack from going in for about 10 days longer. Greater activity in both the farm implement and automobile industries is indicated by both fresh orders and specifications against contracts. A large implement maker has entered the market for 3300 tons of foundry for fourth quarter. The largest recent sale was to a Wisconsin melter who bought 4500 tons of coke iron and 1000 tons of charcoal for fourth quarter. A southern Wisconsin user closed for 1000 tons of foundry for the same delivery and a Chicago buyer bought 300 tons of charcoal. Another Chicago melter purchased 600 tons of foundry for fourth quarter. A number of sales of silvery are reported, among them 200 tons for local delivery and 100 tons for shipment into Wisconsin. Little Southern iron is finding a market in this territory, but we note a sale of 100 tons at \$17.50, base Birmingham. A Chicago buyer is inquiring for 500 tons of low phosphorus for

October and November delivery at a plant in the Pittsburgh district.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 Foundry, sil. 1.75 to 2.25	\$20.50 to \$21.00
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00 to 21.50
Malleable, not over 2.25 sil.	20.50 to 21.00
Basic	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	22.18
Southern No. 2, sil. 1.75 to 2.25	\$23.51 to 24.01
Low phos., sil. 1 to 2 per cent, copper free	31.70
Silvery, sil. 8 per cent	34.29 to 35.29
Electric ferrosilicon, 14 to 16 per cent	43.42

Ferroalloys.—Outside of a few carlot sales of ferromanganese and spiegeleisen, the market has been devoid of features.

We quote 80 per cent ferromanganese, \$102.56, delivered; 50 per cent ferrosilicon, \$75, delivered; spiegeleisen, 18 to 22 per cent, \$40.56, delivered.

Plates.—The bulk of current plate business is coming from railroad car builders. Orders for 6200 freight cars just placed by the Illinois Central involve 68,000 tons of plates, shapes and bars, most of which has been distributed among local mills. Tank fabricators are also buying plates in fair quantities, although recent lettings have been small. Considerable oil storage tank work is in immediate prospect, however. Plates are quoted at 2.10c. to 2.15c., Chicago, but local producers find it increasingly difficult to figure in competitive territories owing to the pronounced weakness of plate prices in other market centers.

The mill quotation is 2.10c. to 2.15c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Fabricating awards for the week, aggregating over 10,000 tons, exceed the average for the past month. An addition to the Morrison Hotel, Chicago, 5500 tons, was awarded to the Duffin Iron Works, while 3000 tons for a Chicago apartment building was placed with the Morava Construction Co. New inquiries on which early action is expected include catenary bridges and trestles for the Illinois Central's local electrification project, 2500 tons, and a store building for the Wieboldt Co., Chicago, 3000 tons. Plain material prices remain unchanged.

The mill quotation on plain material is 2.10c. to 2.15c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—A steady, but gradual, growth in business, well diversified and embracing buyers of practically all classes, characterizes the soft steel bar market. Although the low level of current prices might be expected to encourage speculative buying, orders are apparently being confined to specific requirements, thereby reflecting an actual increase in consumption. The automobile builders are among those who are buying more liberally. Prices on soft steel bars range from 2c. to 2.10c., Chicago, but mills are making an effort to establish a minimum of 2.05c. and with some success. In sharp contrast with soft steel, the situation in bar iron must be described as depressingly dull. One important local mill is idle and prices remain unchanged, although it is doubtful whether a further reduction could be forced even if attractive tonnage should come on the market. Mill costs have been increased not only on account of unsatisfactory operations, but because of advances in scrap. Demand for rail steel bars is slowly expanding and mill operations are improving. Prices range from 2c. to 2.10c., f.o.b. mill.

Mill prices are: Mild steel bars, 2c. to 2.10c.; common bar iron, 2.15c. to 2.20c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.20c.

Sheets.—Demand is better by comparison with July, but it cannot yet be described as active, if one judges by the tonnage actually entered on mill books. Inquiries received by Western mills, however, are numerous and may portend a strong buying movement following a definite announcement one way or another

on the suggested establishment of a Chicago base on sheets. No word has yet been given out by the Steel Corporation, but no doubt its policy will be announced before Sept. 21, the time limit for its answer to the Federal Trade Commission. Meanwhile prices are unchanged, with occasional concessions reported.

Mill quotations are 3.50c. for No. 28 black, 2.70c. for No. 10 blue annealed, and 4.60c. for No. 28 galvanized, all being Pittsburgh prices subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 3.80c. for blue annealed; 4.50c. for black, and 5.50c. for galvanized.

Wire Products.—Continued improvement in demand is reflected in further drafts on mill stocks and better mill operations, which now average 55 per cent. Demand has been active for the past six weeks in the South, especially in Oklahoma and Texas. Improved sentiment in Kansas, Nebraska and the Northwest points to heavier orders from those sections. Nail demand has not been affected by declining residential construction, but this is not surprising in view of increasing building activity in the country districts, where little work has been undertaken during the past three years. Prices are unchanged, but there is considerable speculation among buyers as to whether the Steel Corporation will establish a Chicago base in compliance with the order of the Federal Trade Commission. At the most such a step would probably affect common products only, and not specialties. No word has been given out, however, to indicate what course the corporation will pursue. In the meantime, prices, which are unchanged, are shown on page 734.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.70 per 100 lb.; extra for black annealed wire, 15c. net 100 lb.; common wire nails, \$3.55 per 100 lb.; cement coated nails, \$2.80 per keg.

Rails and Track Supplies.—The Illinois Central has concluded negotiations for 60,000 tons of rails for delivery over the first half of next year. Of this total 25,000 tons will be rolled at Gary, 20,000 tons by the Tennessee mill and 15,000 tons by the Inland Steel Co. Release of tonnage against standing rail contracts is liberal. Orders received by local mills for track supplies are confined to scattered, small tonnages. The Chesapeake & Ohio and the Norfolk & Western have placed round tonnages of tie plates with mills outside this market. The approach of the winter season has brought with it a gradual increase of activity at the coal mines, which has resulted in revived demand for light rails. Prices on light rails, however, are weaker, ranging from 1.80c. to 1.90c., mill.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. makers' mill.

Standard railroad spikes, 2.80c. to 3c. mill; track bolts with square nuts, 3.80c. to 4c. mill; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c. f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Reinforcing Bars.—This market continues to lag with apparently no signs of immediate improvement. Little road work is being undertaken and this has an important bearing on the concrete bar business because the tonnage which has been bought for highway construction during the past year or two has compensated for the decline in industrial work. There has also been little speculative apartment or hotel construction since the local banks shut down on building loans of that class some four or five months ago. A few large local projects are still pending, but very little new prospective work is appearing. The Concrete Steel Co. has been awarded 525 tons for a service building for the Hotel Sherman Annex, Chicago. The same company will furnish 400 tons for two public schools at Des Moines, Iowa. The City of Minneapolis has awarded 311 tons for the Fridley Filtration plant to Cowin & Co. Additional reinforcing steel to the amount of about 300 tons will be bought for the Snelling-Mendota Bridge, Minneapolis. A considerable tonnage will be placed for the Morrison Hotel addition, Chicago, but plans will not be issued for about a month. Small lettings, under 100 tons each, which ordinarily form the bulk of the bar dealers' business, have declined sharply. The ruling warehouse price on reinforcing bars appears to be 2.20c., Chicago. For mill shipment attractive tonnages have been placed at lower figures.

Bolts and Nuts.—As usual, the first reaction following an advance is a quiet market. Bolt makers, however, appear to be united in their determination to adhere to the new quotations, which, they state, are absolutely essential to cover their costs. Business taken at lower prices during the summer, it is said, was booked at a loss. The outlook for fall business is regarded as good, and particular attention is called to the automobile industry which promises to resume its rôle as a leading consumer of bolts and nuts.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to $\frac{3}{4}$ x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, \$4 off; blank nuts, \$4 off; coach or lag screws, gimlet points, square head, 65 per cent off.

Cast Iron Pipe.—Increased interest in the market by municipalities, as evidenced by larger lettings and promising new inquiries, has not yet been followed by any stiffening in prices. The National Cast Iron Pipe Co. will furnish 1500 tons for Cushing, Okla.; 700 tons of 12-in. for Detroit, and 400 tons for Deshler, Ohio. James B. Clow & Sons will also supply 700 tons of 12-in. for Detroit. Chicago has awarded 100 tons of fittings to the American Cast Iron Pipe Co. Detroit takes bids Sept. 18 on 2500 tons of 8-in., while Oakland City, Ind., will receive figures Sept. 22 on 610 tons of 10-in. Pittsfield, Ill., has asked for revised contractors' bids Sept. 29 on 320 tons of 4-in., 506 tons of 6-in. and 249 tons of 8-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$56.20 to \$57.20; 6-in. and over, \$52.20 to \$53.20; Class A and gas pipe, \$5 extra.

Hot-Rolled Strip.—Improvement in automobile production has not yet been reflected in demand for hot strip steel, which is quoted at 2.60c. to 2.75c., Chicago.

Old Material.—As a result of the recent uninterrupted advance in prices, selling has been encouraged with the result that more material has been offered than the market can immediately absorb. An indication of this condition has been the appearance of quite a number of distress cars on track, which could find buyers only at concessions below recent peaks; while the edge is off the market and prices of most grades are weaker than recently, definite reductions below the figures quoted a week ago are lacking, pending further developments. Although a slight reaction may take place at this time, the trade does not look for anything resembling a sustained decline in prices, with all signs pointing to a general industrial revival. Consumer buying during the week has been confined largely to orders for malleable and low phosphorus grades. Railroad lists include the Chesapeake & Ohio, 6000 tons; the Santa Fe, 3600 tons, and the Soo Line, 1300 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$18.50 to \$19.00
Cast iron car wheels	18.50 to 19.00
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	20.00 to 20.50
Railroad tires, charging box size	19.75 to 20.25
Railroad leaf springs, cut apart	19.75 to 20.25
Rolls for rolling	17.50 to 18.00
Steel rails, less than 3 ft.	18.50 to 19.00
Heavy melting steel	16.50 to 17.00
Frogs, switches and guards cut apart	14.50 to 17.00
Shoveling steel	16.25 to 16.75
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	13.50 to 14.00
Axle turnings	14.00 to 14.50
Steel angle bars	18.00 to 18.50
Steel knuckles and couplers	19.75 to 20.25
Coil springs	20.50 to 31.00
Low phos. punchings	17.50 to 18.00
Machine shop turnings	10.00 to 10.50
Cast borings	12.00 to 12.75
Short shoveling turnings	12.00 to 12.75
Railroad malleable	18.50 to 19.00
Agricultural malleable	17.00 to 17.50

Per Net Ton	
Iron angle and splice bars	18.00 to 18.50
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	25.00 to 26.00
Steel car axles	19.00 to 19.50
No. 1 busheling	12.50 to 12.00
No. 2 busheling	8.50 to 9.00
Pipes and flues	11.50 to 12.00
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.75 to 15.25
No. 1 machinery cast	18.50 to 19.00
No. 1 railroad cast	17.00 to 17.50
No. 1 agricultural cast	17.00 to 17.50
Locomotive tires, smooth	17.00 to 17.50
Stove plate	15.50 to 16.00
Grate bars	15.50 to 16.00
Brake shoes	16.00 to 16.50

New York

Pig Iron Market Fairly Active—Increased Booking of Structural Shapes

NEW YORK, Sept. 16.—The market has been fairly active and sales amounting to about 15,000 tons were made last week, with the inquiry of the Pennsylvania Railroad for 5000 tons still pending. Sales included 6000 tons for the Central Foundry Co., 2000 tons for the Gould Coupler Co., two 2000-ton lots for fourth quarter and one 1000-ton lot for early delivery. The new inquiries include one for 700 tons for first quarter of 1925, but very little interest is shown in deliveries so far in advance by either buyers or sellers. The American Locomotive Co. is inquiring for 2450 tons of foundry iron and 600 tons of charcoal for delivery within 60 days. The General Electric Co. is in the market for about 2000 tons of high silicon iron and another company for between 3000 and 4000 tons of foundry grades for southern plants. Scarcity of high silicon iron continues, and one Buffalo seller has advanced its quotation on No. 1 50c. to \$21. In spite of the dullness which has prevailed a considerable part of the time, a number of furnace companies find their stocks so depleted that they have difficulty in meeting the requirements of customers, but do not feel justified in blowing in more stacks until prices advance.

We quote delivered in the New York district as follows, having added to furnace price \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	\$22.27 to \$22.77
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.27 to 23.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.77 to 23.27
Buffalo, sil. 1.75 to 2.25.....	23.91 to 24.41
No. 2 Virginia, sil. 1.75 to 2.25..	29.94 to 30.44

Ferroalloys.—It is estimated that fully 30,000 tons of ferromanganese was sold on the recent buying movement at prices ranging from \$90 to \$95, seaboard basis. It is therefore natural that the market should be very quiet now and both sales and inquiry are exceedingly light. We note the sale of 100 tons, besides some carload lots, at \$95, and an inquiry for 150 tons as well as for small lots. The spiegeleisen market has been more active this week than in several months; total sales have aggregated around 2500 tons, well distributed in moderate lots among a number of consumers. New inquiry is fairly large and also well distributed, and the market has a better tone and better prospects than in some time. It is understood that business, which has been done has been at the quotations which have prevailed for some time.

Cast Iron Pipe.—Makers are still fairly well booked ahead. There has been a small volume of municipal buying recently, an outstanding purchase being the 7000 tons for the Department of Water Supply, Gas and Electricity, New York, bids on which were opened Sept. 15. The following low bids were submitted: Section 1, 4000 lengths of 8-in., \$59.40 per ton, bid by R. D. Wood & Co.; Section 2, 25 lengths of 4-in., 1500 lengths of 6-in., 4000 lengths of 8-in. and 1500 lengths of 12-in., each item, \$59.50 per ton, bid by Warren Foundry & Pipe Co.; Section 3, 3000 lengths of 8-in., \$59.60, bid by United States Cast Iron Pipe & Foundry Co.; Section 4, 300 lengths of 6-in., 4000 lengths of 8-in., 50 lengths of 10-in., each item \$59.60 per ton, bid by United States Cast Iron Pipe & Foundry Co.; Section 5, 150 lengths of 6-in., 3500 lengths of 8-in., 520 lengths of 12-in., each item, \$59.40 per ton, bid by Donaldson Iron Co. Low bids on the fittings ranged from 74c. to 76c. per lb. These prices are all delivered and piled in City of New York yards, the cost of this service being about \$3 per ton. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$56.60 to \$57.60; 4-in. and 5-in., \$61.60 to \$62.60; 3-in., \$71.60 to \$72.60, with \$5 additional for Class A and gas pipe. Demand for soil pipe is light as the usual seasonal quiet sets in. In efforts to obtain business, however, many makers are shading the established schedules by several points and the market as a whole is in an uncertain and weak condition. We quote nominal discounts of both southern and northern makers, f.o.b.

New York, as follows: 6-in., 45 to 46½ per cent off list; heavy, 55 to 56½ per cent off list.

Finished Iron and Steel.—A slight increase in the volume of structural steel work is the only noteworthy gain in business over the first 10 days of September. Further inquiries for railroad freight cars give promise of larger demand for steel from that source. The Reading Co. may place orders for 3000 steel cars this week, and an inquiry for 3000 cars has come from the Southern Railway. The Gulf Coast Lines are inquiring for 1250. General buying by manufacturing consumers and jobbers has shown no marked gain this month, and in some respects the volume of buying in the first half of September has not kept pace with that of the latter half of August. Price weakness continues. Bars, which have been held more firmly than some of the other products, show signs of weakening, concrete reinforcing bars, it is reported, having been sold at 2c. and 2.05c., Pittsburgh, and this weakness has to some degree affected the price of merchant steel bars, though just how much the latter have weakened is not fully apparent. Less low-priced competition is being met with on sheets, it being easier for mills quoting 4.60c. on galvanized, 3.50c. on black and 2.70c. on blue annealed to obtain those prices. Inquiry for plates has not gained, and the price situation is still very unsettled. Sales of carload lots in the past week have usually been at 1.65c., Pittsburgh, but quotations of 1.60c. have been given on some of the desirable lots.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c.; plates, 1.94c. to 2.04c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.34c.

Warehouse Business.—The improvement in business that was expected by some sellers to develop after Labor Day has not materialized and although a few warehouses report slightly larger volume of business, purchasing is but little better in most products than last month.

Coke.—Prices continue fairly stable and for prompt shipment range from \$4 to \$4.50 per ton for standard foundry and \$3.25 to \$3.50 for standard furnace. By-product is unchanged at \$10.41, Newark and Jersey City, N. J. Rogers, Brown & Co. have been appointed sole selling agents in the State of New York for Semet-Solvay by-product coke, both foundry and domestic, produced at Harriet, N. Y.

Old Material.—The market continues quiet but prices are firm with a slightly upward tendency. No. 1 heavy melting steel is being purchased by brokers at from \$16.50 to \$17.50 per ton, delivered eastern Pennsylvania consumers, the price depending upon shipment. A Claymont, Del., consumer has contracts at \$18 and a Pottsville, Pa., mill is reported to have closed on a tonnage at \$18 per ton. Borings and turnings are being bought by some brokers at \$14.50 per ton, delivered Johnstown, and machine shop turnings are being purchased at \$14 per ton, delivered Lebanon, Pa., and Phoenixville. Specification pipe is unchanged at \$16 and \$16.50 per ton, delivered eastern Pennsylvania consumers. Stove plate is holding at \$14.50 for local consumers taking a \$2.02 freight rate and \$15.50 per ton delivered on a slightly higher rate into eastern Pennsylvania.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$13.00 to \$13.50
Heavy melting steel, railroad or equivalent	14.00 to 14.50
Rails for rolling.....	14.50 to 15.00
Relaying rails, nominal.....	24.00 to 25.00
Steel car axles.....	17.50 to 18.50
Iron car axles.....	26.00 to 28.00
No. 1 railroad wrought.....	14.50 to 15.00
Forge fire	10.25 to 10.75
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (clean).....	9.50 to 10.00
Machine shop turnings.....	9.50 to 10.00
Mixed borings and turnings.....	8.50 to 9.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	12.25 to 12.75
Stove plate	11.50 to 12.50
Locomotive grate bars.....	11.50 to 12.50
Malleable cast (railroad).....	14.00 to 14.50
Cast iron car wheels.....	14.50 to 15.00
No. 1 heavy breakable cast.....	12.25 to 12.75

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$15.50 to \$16.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.50 to 14.00
No. 2 cast (radiators, cast boilers, etc.)	12.50 to 13.00

Buffalo

Fair Inquiry for Pig Iron—Decreased Demand for Structural Steel

Pig Iron.—Inquiry for the past week reached a total of 10,000 to 15,000 tons of all grades of iron with a 6000-ton inquiry for foundry put out by a railroad company the largest. This business is not expected to come to this territory. It is understood that the Gould Coupler Co. has not yet purchased on its 3000-ton inquiry for basic. Other sizable inquiries included one for 1800 tons of foundry and one for 1000 tons of foundry. Other inquiries were for 500 tons, 475 tons, 400 tons, 300 tons, etc. On a 2000-ton inquiry from New England listed last week a local maker took half the tonnage. The demand for iron finds some makers willing here and there to shade the \$19.50 price on sizable business, while others are not willing to go below. In one case a local maker turned down an order for 1000 tons of foundry, No. 2 plain, which it was sought to place under \$19.50. Correspondingly this same interest obtained \$21 on a small lot of 2.75 to 3.25 silicon foundry and \$21.50 for a car of 3.25 to 3.50 silicon. The largest sale total recorded for the week by any one interest was 4500 tons.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$19.00 to \$19.50
No. 1 foundry, sil. 2.75 to 3.25....	20.00 to 21.00
No. 2 foundry, sil. 2.25 to 2.75....	19.50 to 20.00
Malleable, sil. up to 2.25.....	19.00 to 19.50
Lake Superior charcoal.....	29.25

Old Material.—The dealers continue to keep the market boiling, but buying by the mills is comparatively small. A Depew user is reported to have bought 2500 to 3000 tons of heavy melting steel at \$18, Depew, and it is said that any considerable tonnage of strictly No. 1 steel would command \$17 to \$18 at least. So far, two of the larger users in this field have declined to pay \$18, though the larger one would probably give \$16.50 to \$17. Youngstown has been paying \$19.50 for Buffalo steel, it is said, making that price about \$16.60, Buffalo. Outside of some bargain buying, Buffalo mills have not bought any material in several days. Most of them are using more pig iron in their mixture, particularly one interest which has considerable of this commodity piled in its yards. Much depends on how long the mills can stay out of the market; already many dealers are beginning to suffer from the mills' prolonged buying inactivity. A greater movement is noted in cast scrap car wheels and stove plate.

We quote f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel.....	\$17.00 to \$18.00
Low phosphorus, 0.04 and under	19.50 to 20.50
No. 1 railroad wrought.....	15.50 to 16.00
Car wheels.....	16.00 to 16.50
Machine shop turnings.....	11.50 to 12.50
Cast iron borings.....	12.00 to 12.50
No. 1 busheling.....	15.50 to 16.00
Stove plate.....	16.00 to 16.50
Grate bars.....	15.00 to 15.50
Bundled sheets.....	12.50 to 13.00
Hydraulic compressed.....	15.50 to 16.50
Railroad malleable.....	17.50 to 18.50
No. 1 machinery cast.....	17.50 to 18.00

Finished Iron and Steel.—Structural work seems to have fallen off and inquiries for shapes and reinforcing bars are not so heavy. Award for the superstructure of the local pumping station, a 300 to 400-ton job, has been made to a local concern, and two Rochester, N. Y., jobs, one of 100 tons for a building for the University of Rochester and another of 100 tons for a Flickinger store building, have been awarded locally. Road material contracts pending now include one for 100 tons for a Hornell, N. Y., job, and another for 175 tons for a Holly, N. Y., job. The price on reinforcing bars seems to be 2.15c. mill and 2.30c. warehouse. Carbon steel bar jobbers are more active with the price fairly firm at 2.10c., though one lot was placed at somewhat lower, a local mill having taken the difference in freight rate into consideration on competing business. Few sheet inquiries are out to test the market, which is generally 3.50c. for black, though this price has been shaded. Bolt prices have stiffened and 60 and 10 off is being quoted now on machine bolts. Some third quarter may be placed lower than this, but this looks

like the price for fourth quarter. Reports of \$34 having been named by a Buffalo billet maker remain unverified.

Steel bars, 3.30c.; iron bars, 3.35c.; reinforcing bars, 3.30c.; structural shapes, 3.40c.; plates, 3.40c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.35c.; banda, 4.05c.; hoops, 4.40c.; cold finished rounds, 4.20c.; cold-finished shapes, 4.70c.

Birmingham

Heavy Buying of Pig Iron—Increased Activity in Cast Iron Pipe

BIRMINGHAM, ALA., Sept. 16.—Sales of pig iron for delivery during the fourth quarter of the year by Southern furnace interests are beginning to amount to fair tonnage, one company having sold a very large amount compared to sales in the past several weeks, and two others disposing of around one-third of the probable make of the coming quarter. Quotations are now given at \$18 and \$18.50 per ton, No. 2 foundry, but persistent reports are that sales have been made under the \$18 figure. The Sloss-Sheffield Steel & Iron Co. blew in No. 2 city furnace Saturday, and now has four of its eight furnaces in operation. President J. W. McQueen stated that the market conditions were such as to warrant the blowing in of another furnace. It is generally understood that one of the Birmingham furnace companies has booked an order for 50,000 tons to be delivered over a period of four months to one of the larger melters. Another order for 12,500 tons is reported. Inquiries have started in with more semblance of trades being consummated. Shipments of iron in various directions are now under way and the local melt is showing an upward inclination. Good reports are made by the various iron using industries of the district. Even the Hardie-Tynes Mfg. Co., the large foundry and machine shop concern which suffered a serious conflagration recently, is melting iron in its foundry and is having some of its work done in other shops.

We quote per gross ton, f.o.b. Birmingham district furnace as follows:

No. 2 foundry, 1.75 to 2.25 sil....	\$17.50 to \$18.00
No. 1 foundry, 2.25 to 2.75 sil....	15.00 to 15.50
Basic.....	15.50 to 19.00
Charcoal, warm blast.....	30.00 to 31.00

Cast Iron Pipe.—Pipe lettings have been heavy recently, even soil pipe and fitting manufacturers reporting increase in business. Gas and water pipe plants are operating to capacity and are shipping as quickly as produced. Recent lettings assure steady operation through the rest of the year and inquiries indicate that winter buying will be good. The quotations have been easing. Pipe, 6 in. and over, is quoted around \$45 to \$46, and the 4-in. product at \$49 and \$50. Many of the soil pipe producers have contracts which call for steady production, and there has been some buying of pig iron in larger quantities. The local pipe shops appear to be melting iron in greater quantity than for several months. Railroad authorities say that movements of cast iron pipe, the pressure as well as the soil pipe, are somewhat more extensive, especially in soil pipe. Prospects are bright in all circles of cast iron pipe making.

Steel.—Finishing departments of the steel plants of the Birmingham district are producing steadily, wire and nails moving in better quantity and other shapes of the product in good demand. Fabricating plants express belief that the present month will see greater business handled than in August and the latter showed decidedly improved conditions over the previous three months. All shipments are being rushed, including structural steel, tanks and other work. The Gulf States Steel Co. has almost its entire finishing mills going and three out of six of the open-hearth furnaces, while the Tennessee Coal, Iron & Railroad Co. plants are going about 80 to 85 per cent. Steel bars in this district are quoted 2.25c. to 2.35c. Birmingham.

Coke.—While the coke trade is showing signs of reviving, no effort has as yet been given toward a larger production. The beehive oven operations saw a greater readjustment in this territory than the by-product

plants. However, both classes of coke are feeling the effects of better sentiment. The quotations still range between \$4.50 and \$5.25 for foundry coke, both beehive and by-product.

Scrap.—Slight modification in quotations was noted in the last few days in No. 1 cast and stove plate, despite the fact that there is still some demand for these products. Heavy melting steel and other steel scrap hold the same price that has prevailed for the past several weeks. Old material dealers are confident. Some are preparing a large quantity of scrap for future needs and have a larger yard force than for some time. A few contracts are again reported, delivery to continue over the rest of the year, though the tonnages are not very large.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	12.50 to 13.00
Railroad wrought.....	12.00 to 13.00
Steel axles.....	17.00 to 18.00
Iron axles.....	19.00 to 19.50
Steel rails.....	12.50 to 13.00
No. 1 cast.....	14.00 to 15.00
Tram car wheels.....	15.00 to 16.00
Car wheels.....	14.00 to 15.00
Stove plate.....	13.50 to 14.00
Machine shop turnings.....	6.00 to 7.00
Cast iron borings.....	7.00 to 8.00
Rails for rolling.....	15.00 to 16.00

St. Louis

Pig Iron and Old Material Markets Strong, but Buying Is Light

ST. LOUIS, Sept. 16.—The pig iron market continues strong, but the strength is due more to a possible shortage of production and the prospects for more buying rather than on any buying of the moment. For very little business is being placed. The melters in this district are covered for their present wants and the orders for finished products do not justify any extensive buying plans. The stove plants in the district report that there is a falling off in business, and the job foundries' melt is said to be light. The market for Northern iron is firm at \$21, Chicago; Southern iron at \$18 to \$18.50, Birmingham, and the St. Louis Coke & Iron Co. unchanged at \$21.50 to \$22, Granite City. The latter concern sold 2000 tons of basic to an East Side melter for prompt delivery and miscellaneous lots of foundry iron totaling 300 tons. An Atchison, Kan., melter bought 500 tons of foundry iron. A melter in the district is in the market for 1000 tons of basic and a Kansas City concern wants 200 tons of foundry iron for prompt shipment.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25...	\$23.16
Northern malleable, sil. 1.75 to 2.25.....	23.16
Basic.....	23.16
Southern fdy., sil. 1.75 to 2.25 (rail).....	23.17 to 23.67
Southern fdy., sil. 1.75 to 2.25 (rail and water).....	21.28 to 21.78
Granite City iron, sil. 1.75 to 2.25.....	22.31 to 22.81

Finished Iron and Steel.—Steel mills are wondering whether there will be any buying of rails by railroads centering in St. Louis. This is the month purchases should be made, but so far the roads have given no indications that there will be rails bought. No railroad inquiries of consequence are pending. Buying in other lines continues on a hand-to-mouth basis. The market is weak, and while mills are trying hard to maintain prices, one hears occasionally of concessions being made to get business.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, 3/4-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40 and 5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, \$3.50 off list.

Coke.—Piles of by-product coke at the ovens continue to grow. Dealers of fuel insist on holding back their orders for domestic grades because the public hesitates about placing advance orders, with the result that not more than 20 per cent of the business normally placed at this time of year has been booked. The demand for foundry coke is also light.

Old Material.—The market for old material is strong. No. 1 busheling is \$1 a ton higher, railroad malleable and machine shop turnings are up 50c., the remainder of the list being unchanged. No new purchases of consequence by consumers were made during the week, but negotiations are pending for some good-sized tonnages, especially in steel and foundry grades. Some of the purchasing agents are still holding out for lower prices, but dealers insist that the law of supply and demand entitles them to the present market prices. There is a shortage of material to be had, they insist. New railroad lists include the following: Kansas City Southern, 600 tons; Northern Pacific, 1600 tons; Southern Railroad subsidiaries, 700 tons; Norfolk & Western, 5000 tons; Rock Island, 3500 tons, and Santa Fe, 3500 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails.....	\$16.50 to \$17.00
Rails for rolling.....	18.00 to 18.50
Steel rails less than 3 ft.....	19.00 to 19.50
Relaying rails, 60 lb. and under.....	25.00 to 26.00
Relaying rails, 70 lb. and over.....	32.50 to 33.50
Cast iron car wheels.....	17.50 to 18.00
Heavy melting steel.....	15.50 to 16.00
Heavy shoveling steel.....	15.25 to 15.75
Frogs, switches and guards cut apart.....	17.50 to 18.00
Railroad springs.....	21.00 to 21.50
Heavy axles and tire turnings.....	12.50 to 13.00
No. 1 locomotive tires.....	17.00 to 17.50
Per Net Ton	
Steel angle bars.....	16.00 to 16.50
Steel car axles.....	19.50 to 20.00
Iron car axles.....	24.00 to 24.50
Wrought iron bars and transoms.....	18.25 to 18.75
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	14.00 to 14.50
Cast iron borings.....	12.00 to 12.50
No. 1 busheling.....	13.50 to 14.00
No. 1 railroad cast.....	17.50 to 18.00
No. 1 machinery cast.....	18.00 to 18.50
Railroad malleable.....	14.50 to 15.00
Machine shop turnings.....	8.50 to 9.00
Champion bundled sheets.....	8.00 to 8.50

Cincinnati

Wheeling Company Buys Round Tonnage of Basic Pig Iron for Shipment by Barge

CINCINNATI, Sept. 16.—The Wheeling Steel Corporation has purchased 5000 tons of basic for shipment to Portsmouth, Ohio, by barge from Ironton. It is understood the fact that the low water rate enabled the furnace to get a somewhat higher price than if the shipment were to be by rail. Prices on Southern iron are showing a gradual upward movement. Tennessee iron is still selling at \$17.50, Birmingham, and Alabama iron at \$18. There have, however, been small sales of the latter at \$18.50 and one Alabama furnace is reported to be asking \$19 for fourth quarter business. Many of the dealers state that they are not soliciting business at the present prices and are limiting their sales to supplying the needs of their regular customers. There have been only a few inquiries the past week, including one from an Indianapolis melter for 500 tons of Southern iron and 500 tons of Northern iron.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base).....	\$21.55 to \$22.05
Southern fdy., sil. 2.25 to 2.75.....	22.05 to 22.55
Southern Ohio silvery, 8 per cent.....	31.77
Southern Ohio fdy., sil. 1.75 to 2.25.....	22.27
Southern Ohio, basic.....	21.77
Southern Ohio malleable.....	22.27

Sheets.—There has been an increase in buying during the past week as compared with the previous week. The volume of business booked, however, is slightly

below that maintained during August. Indications are that there may be sufficient improvement in sales the latter part of the month to bring the September total up to the August volume. Orders have been for small quantities, but they have been numerous. The prices of 2.70c. for blue annealed sheets, 3.50c. for black and 4.60c. for galvanized have not changed. The market for automobile body sheets is quiet.

Tin Plate.—Good sales of tin plate were reported in the Cincinnati market during the past week, but orders are not holding up to the level established in August. Can manufacturers continue to operate their factories on a heavy schedule and their purchases of tin plate have been holding up well. The price of \$5.50 per base box is firm. There are a number of good inquiries on hand and dealers state that they expect orders to increase the latter half of September.

Reinforcing Bars.—There has been a noticeable improvement in the sale of reinforcing bars. While all of the business is confined to small orders, the tonnage has taken a decided upward turn. There has been a slight increase in building operations in Cincinnati territory and dealers are encouraged at the outlook. Billet steel is bringing 2.10c. to 2.15c. at present, with rail steel bars selling at 1.90c. to 2.10c.

Warehouse Business.—Reports from dealers as to warehouse business in the past week are optimistic. Actual orders are increasing and it is anticipated that sales will run a little ahead of those during August, which was the biggest month since May. Orders are principally for small tonnages, although there was one 500-ton order placed locally. Prices have not changed, but are strong at existing quotations.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.55c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, 3.30c.; common wire nails, \$3.30 per keg base; cement coated nails, \$3 per keg.

Structural Steel.—Activities in structural steel have been very quiet in the past few weeks. No awards of any consequence have been announced. Inquiry among companies reveals belief that little improvement is to be looked for in the immediate future.

Finished Materials.—Business was more active than during the previous week in finished materials. While orders are still for restricted amounts and buyers are slow in placing business, the sales have gone up somewhat. A gradual but steady improvement is perceivable, and local concerns are confident that this upward trend will continue. The demand for plates has not been heavy and sales have been comparatively light. There has been a fair volume of small orders. The price of plates is fairly steady at 2c., although there has been some business placed at 1.90c. Business in shapes is decidedly better and sales are greater than they were at the beginning of the month. Here again it is expected that sales will continue on an upward course. Prices are firm at 2.10c. The market for light rails is quiet at the present time and little business is being booked. Inquiries have not been encouraging, and it is not thought that much business will develop in the next few weeks. Wire products have had better sales the past ten days. The volume of orders has gradually increased throughout the month to date and September is expected to show an improvement over August. There is still a sharp tendency on the part of buyers to demand concessions in price. Some of the dealers are yielding to this demand, but others are firm in holding to their quotations. Wire nails are bringing \$2.80 as they did a week ago. Plain wire is selling at \$2.55.

Old Material.—There is a much better tone to the scrap market. Major activities during the past week have been confined to trading among the dealers. The stock of consumers is low at present and they are expected to come into the market soon. While the amount of consumer buying is below normal, it has improved to some extent. The monthly railroad lists which are closing this week are smaller than usual. Prices are

displaying an upward tendency and advances have been recorded in a number of items. Dealers are looking to the immediate future with optimism. They believe that the latter part of the month will witness much better business.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	\$14.50 to \$15.00
Scrap rails for melting	13.00 to 13.50
Short rails	17.00 to 17.50
Relaying rails	29.50 to 30.00
Rails for rolling	15.00 to 15.50
Old car wheels	13.50 to 14.00
No. 1 locomotive tires	15.00 to 15.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.00 to 14.50
Loose sheet clippings	10.50 to 11.00
Champion bundled sheets	11.50 to 12.00

Per Net Ton	
Cast iron borings	10.00 to 11.00
Machine shop turnings	9.00 to 9.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	15.50 to 16.00
Iron axles	21.50 to 22.00
No. 1 railroad wrought	11.00 to 11.50
Pipes and flues	8.00 to 8.50
No. 1 busheling	10.00 to 10.50
Mixed busheling	8.00 to 8.50
Burnt cast	10.50 to 11.00
Stove plate	10.50 to 11.00
Brake shoes	12.00 to 12.50

Coke.—The coke market shows more activity than a week ago. There has been considerable increase reported in sales of domestic coke in the past ten days. Prices are firm at the quotations which prevailed last week.

Connellsville furnace, \$3; foundry, \$4.50 to \$5.50; New River foundry, \$8.50 to \$9; Wise County furnace, \$3.75; foundry, \$4.50 to \$5.50; by-product foundry, \$6.50, Connellsville basis.

Boston

Pig Iron in Somewhat Better Demand, with Prices Generally Firm

BOSTON, Sept. 16.—Although not very active, the pig iron market is not so dull as in some recent weeks. Recent sales include two 1000-ton lots of Buffalo, 1000 tons eastern Pennsylvania as well as numerous smaller tonnages of these two irons, several lots of Alabama and New York and one 500-ton and smaller tonnages of India. The market for No. 2X and higher silicons is firmer than that for No. 2 plain. No. 2 plain, on an attractive tonnage, sold at less than \$19.50, Buffalo, by a furnace supposed to be on that price basis. A Buffalo furnace has solicited No. 2 plain business at \$19 and No. 2X at \$19.50, but No. 2X generally is \$20, and No. 1X, September shipment, sold within a day or two at \$21.50. No. 1X, fourth quarter shipment, is obtainable at \$20.50 and \$21, however. A New York furnace is taking business at prices just under Buffalo quotations. Eastern Pennsylvania No. 2X at \$21, and No. 1X at \$21.50, furnace, figure in recent transactions. India No. 2X is \$22 and \$22.50, duty paid, on dock here, as against \$21, heretofore. A Massachusetts machinery maker took 1000 tons Buffalo No. 2X and 1000 tons eastern Pennsylvania No. 1X. There are no large open inquiries in the market today.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	\$24.15 to \$25.15
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Buffalo, sil. 1.75 to 2.25	23.91 to 24.41
Buffalo, sil. 2.25 to 2.75	24.41 to 24.91
Virginia, sil. 1.75 to 2.25	29.42 to 29.92
Virginia, sil. 2.25 to 2.75	29.92 to 30.42
Alabama, sil. 1.75 to 2.25	27.10 to 27.60
Alabama, sil. 2.25 to 2.75	27.60 to 28.10

Warehouse Business.—The movement of iron and steel out of warehouses is running a little heavier than last month, but the individual orders received continue of a hand-to-mouth character. Warehouse stocks of plates generally are small, but of other material are comfortable and well assorted. Bolts and nuts have been advanced 10 per cent.

Shapes and Plates.—Although plates are more active than they were last month, there is no sufficient

business to stiffen the market. Some mills are holding to 1.70c., Pittsburgh base, but 1.65c. can and has been done. The demand for structural steel is increasing, although individual orders generally concern small tonnages. The market is 2c., Pittsburgh base, offers of 1.90c. apparently having been withdrawn. The Mystic Iron Works, Boston, is calling for bids on its proposed Everett plant. Shape requirements are approximately 1200 tons, and several hundred tons of plates will be needed. Bids have been asked on 700 tons of structural steel for Buenos Aires, the first export business reported in several months. A Buffalo fabricator was the successful bidder for the Narragansett Electric Co., Providence, R. I., plant addition calling for 1200 tons of structural steel and 200 tons of plates.

Coke.—Preliminary estimates place shipments of by-product foundry coke from ovens to consumers during the first half of this month about on a par with those for the first 15 days of August. Although here and there a foundry is melting more iron than a month ago, the majority of New England foundries have not sufficient business booked ahead to warrant increasing coke supplies, even for winter stocking purposes. Both the New England Coal & Coke Co. and the Providence Gas Co. continue to quote by-product foundry coke at \$11.50 a ton delivered in New England. The volume of domestic coke moving from ovens to retail yards is quite heavy.

Old Material.—Renewed buying of heavy melting steel on a moderate scale for shipment to eastern Pennsylvania, and a good demand for mixed borings and turnings for Pennsylvania steel mill consumption are the outstanding features of the local old material market. Both grades of scrap have advanced 50c. a ton. Chemical borings have gone up 25c. to 50c. a ton, not so much because of heavy buying as because of the limited supply. Sales the past week include machine shop turnings and rolling mill borings at \$9 a ton on cars, and bundled skeleton at the same figure. Otherwise the old material market is quiet and unchanged in price.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$19.50 to \$20.00
No. 2 machinery cast.....	16.50 to 17.00
Stove plates.....	15.00 to 15.50
Railroad malleable.....	17.00 to 17.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$12.50 to \$13.00
No. 1 railroad wrought.....	13.50 to 14.00
No. 1 yard wrought.....	12.50 to 13.00
Wrought pipe (1-in. in diam., over 2 ft. long).....	11.50 to 12.00
Machine shop turnings.....	8.50 to 9.00
Cast iron borings, chemical.....	10.50 to 10.75
Cast iron borings, rolling mill.....	8.50 to 9.00
Blast furnace borings and turnings.....	8.50 to 9.00
Forged scrap and bundled skeleton.....	9.00 to 9.50
Shafting.....	18.00 to 19.00
Street car axles.....	18.00 to 19.00
Rails for rolling.....	13.50 to 14.00

Cleveland

Finished Material Selling More Freely—Large Concessions on Sheets

CLEVELAND, Sept. 16.—The volume of finished steel orders booked during the first half of September shows considerable gain over the corresponding period of August. The tonnage placed during the past week in most lines increased slightly over the preceding week and the sentiment in the trade is fairly optimistic. Consumers as a rule are buying in somewhat larger quantities than a few weeks ago and in some cases are placing orders for fourth quarter requirements. The improvement in other lines does not apply to sheets, the demand for which has slowed down. Some good business has come from the automotive industry in alloy steel bars, but some other recent round-lot inquiries from this source for forging bars have not yet resulted in orders. Automobile companies are still following a cautious policy in making commitments. Buyers are continuing their pressure for lower prices and the mar-

ket lacks firmness in most lines although steel bars are stronger than plates and structural material. Cold-finished steel has been reduced \$2 a ton to 2.70c. Concessions to 3.20c. are reported on black sheets on round tonnages. Cement coated nails are selling as low as 2.10c. Structural work is dragging. The Lima Locomotive Works has taken 25 locomotives for the Illinois Central Railroad and six for the Detroit, Toledo & Ironton Railroad. The pig iron market has quieted down. Although a fair number of inquiries have come out for first quarter contracts, furnaces are not willing to sell for that delivery at present prices.

Pig Iron.—The market has not been so active as during the previous week, although one interest with several furnaces sold 8000 tons in foundry and malleable grades in lots of 1000 tons and under. The market is fairly firm, with most Lake and Valley furnaces holding to a maximum of \$20 for foundry iron, and some business is being taken at \$20.50 where competition is largely with Chicago furnaces. On the other hand, quotations of \$19.50 or lower are still being made by a Lake furnace for delivery to points where it has a freight disadvantage. Locally the market is unchanged at \$20.50 at furnace for Cleveland delivery. Reports indicate that a \$19 price is still appearing in Buffalo. Several additional inquiries have come out for first quarter contracts and while a few small lots have been sold, producers as a rule are holding off in the belief that they will get higher prices a little later. We note the sale of several small lots of low phosphorus iron by a Valley producer at \$27.50 and two lots of Bessemer iron aggregating 1000 tons at \$21, delivery on the latter extending into January. Shipments on contracts show a further increase. Automobile manufacturers seem to be adopting a cautious policy but have released considerable tonnage on contracts. The Hanna Furnace Co. will blow in its Dover furnace at Dover, Ohio, late this month.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$19.00
N't'n No. 2 fdy., sil. 1.75 to 2.25.....	\$20.50 to 21.00
Southern fdy., sil. 1.75 to 2.25.....	23.50
Malleable.....	20.50
Ohio silvery, 8 per cent.....	32.52
Stand. low phos., Valley furnace.....	27.50 to 28.00

Iron Ore.—A few small lot sales are reported to consumers that need small tonnages of orders and to fill out their requirements. However, there is no round lot demand and the trade expects that business placed during the remainder of the season will be very light.

Tool Steel.—Manufacturers report a better demand both for carbon and high speed tool steel as shown by an increase in warehouse orders, but mill orders continue light. On 18 per cent tungsten high speed steel, 65c. per lb. is a common quotation.

Alloy Steel.—Ohio mills are comfortably filled with tonnage as a result of recent business from a number of the automobile companies and shops that are making automobile forgings and one is operating its alloy department at 100 per cent. Orders the past few days included 3500 tons from a Cleveland district forge shop. Prices appear to be holding better than they have recently and are fairly firm at the regular quotations shown on page 735.

Bolts, Nuts and Rivets.—The 10 per cent advance in bolt and nut prices appears to have stimulated the market as manufacturers report an increased volume of specifications on old contracts. With some makers orders have increased 50 per cent over a corresponding period in August. Manufacturers report that they are booking considerable business in fourth quarter contracts at the new prices. Semi-finished S. A. E. hexagon nuts have been reduced about 10 per cent following a similar reduction of U. S. S. nuts. The rivet market has stiffened somewhat and prices are holding fairly firm to the regular 2.60c. base.

Steel Bars, Plates and Structural Material.—Concessions to 2.05c. and to 2c. on steel bars previously reported have become more general, although 2.10c. is still a commonly quoted price. Concessions to 2.15c.

are reported on automobile spring steel. The weakness in plates continues and mills are finding it increasingly difficult to get above 1.90c. for small lots. Where competition is unusually keen, an Ohio mill has gone to 1.80c. Structural material ranges from 2c. to 2.10c., the lower price for a desirable lot.

Semi-Finished Steel.—Billets and slabs are being offered at \$36, Pittsburgh, and there are unconfirmed reports of the same price being quoted in Youngstown. However, a local producer reports the sale of several hundred tons of rerolling billets at \$37.50, Youngstown. This price is still being asked for sheet bars.

Sheets.—Steel barrel manufacturers having round lots to purchase have brought out further concessions in black sheet prices. A St. Louis consumer is reported to have purchased 1400 tons at 3.20c. and a 1000-ton inquiry from western Pennsylvania brought out the same price from four mills. However, most mills are holding to 3.50c. and the usual minimum quotation is 3.40c. Blue annealed sheets range from 2.60c. to 2.70c. and galvanized are holding fairly well at 4.60c. Jobbers are taking orders for bundles for mill shipment as low as 4.65c.

Strip Steel.—Weakness has developed in hoops, which have sold as low as 2.50c., and some mills are quoting 2.55c. to 2.60c. Bands are unchanged at 2.40c. Wide strip steel continues irregular. Some mills are quoting a net price of around 2.35c., but where extras are maintained the market is around 2.15c. to 2.20c. On cold-rolled strip steel 4c. is fairly common.

Reinforcing Bars.—The Bourne-Fuller Co. has taken 350 tons for an addition to the Bulkley Garage, Cleveland. Small lots are in fair demand. Billet steel bars lack firmness with 2.05c. to 2.10c. the common range. Rail steel bars are unchanged at 1.90c. to 2c.

Warehouse Business.—Jobbers have reduced prices \$2 a ton on cold-finished steel following a similar reduction by mills. Warehouse business is moderate.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 3.85c.; narrower than 1 in. or lighter than No. 20 gage, 4.35c.; No. 9 annealed wire, \$3.30 per 100 lb.; No. 9 galvanized wire, \$3.75 per 100 lb.; common wire nails, \$3.40 base per 100 lb.

Coke.—The demand for contracts has about died out as foundries that have not already placed contracts are following the policy of buying fuel as needed. Prices are unchanged at \$4.25 to \$5.50 for standard Connells-ville foundry coke and \$6.50 for by-product coke.

Old Material.—The market became more active during the week and prices were marked up \$1 a ton on heavy melting steel and 50c. to \$1 on most other grades. A Cleveland consumer purchased several thousand tons of mixed borings and short turnings, buying one lot at \$15.25 and later paying \$15.50 for an additional tonnage. This compares with \$14.50 paid by another Cleveland consumer for the same grade two weeks ago. Other round lot purchases were made by Warren and Sharon mills. A consumer in the Valley district paid \$19.50 or higher for heavy melting steel and a 1000-ton lot of compressed steel scrap brought \$17.50. Dealers are offering \$19.50 for heavy melting steel scrap for Warren and Steubenville deliveries, or higher than the present market price on basic pig iron. Scrap offered by the Nickel Plate Railroad last week went at high prices, railroad malleable bringing \$16.25 and couplers and knuckles \$18.60 per net ton.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$16.75 to \$17.25
Rolls for rolling.....	17.00 to 17.25
Rolls under 3 ft.....	18.00 to 19.00
Low phosphorus melting.....	19.00 to 19.25
Cast iron borings.....	14.75 to 15.00
Machine shop turnings.....	13.75 to 16.00
Mixed borings and short turnings.....	14.75 to 15.00
Compressed sheet steel.....	14.50 to 14.75
Railroad wrought.....	15.00 to 15.50
Railroad malleable.....	18.50 to 18.75
Light bundled sheet stampings.....	13.75 to 14.00
Steel axle turnings.....	15.00 to 15.50
No. 1 cast.....	19.25 to 19.50
No. 1 busheling.....	14.25 to 14.75
Drop forge flashings.....	13.50 to 13.75
Railroad grate bars.....	15.00 to 15.50
Stove plate.....	15.00 to 15.50
Pipes and flues.....	13.00 to 13.50

Philadelphia

Expected September Increase in Steel Buying Has Not Materialized

PHILADELPHIA, Sept. 16.—Optimism continues the prevailing sentiment, although tempered somewhat by disappointment that September buying of steel and pig iron has not developed to the degree hoped for. General buying is certainly no better than that of the latter half of August, and except for the increasingly bright prospects for continued railroad buying of cars and locomotives, there is little tangible improvement. So far the purchasing of railroad equipment has not benefited the Eastern mills, but it is probable that some of the 3000 cars to be bought by the Reading, perhaps this week, will be built at Eastern car shops, and plate orders may come to Eastern mills. The inquiry of the Southern Railway for 50 locomotives, 3000 freight cars and 38 passenger cars may also benefit directly the mills of this district if the equipment is purchased. The Reading Railroad is inquiring for its 1925 rail requirements, which may be 15,000 to 20,000 tons, but the needs of the Pennsylvania are still unannounced, this road not yet having fully specified on its last contract.

Price weakness continues in steel. Each drop of \$1 or \$2 a ton has been marked by mill representatives as the probable end of the decline, but it has extended considerably beyond the expectations of the trade, as is often the case, and no signs of an upward turn have yet appeared. This week finds weakness in steel bars, which except for reinforcing grades, have held pretty well at 2.10c., Pittsburgh. But sales have been made at 2c. for both merchant steel and concrete bars. The regular market on merchant steel has probably not yet reached 2c., but the tendency is now in that direction. Structural shapes are weak at 1.90c., Pittsburgh, and nothing but small lots command as high as 2c.

Pig Iron.—In the past few weeks the Eastern pig iron market has shown a moderate degree of firmness, and some furnaces advanced their quotations to the basis of \$21, furnace, for No. 2 plain, and a further advance to \$21.50, base, was talked of by one or two. Competition for 5000 tons bought by a soil pipe company brought out prices as low as \$20, base, at which figure the business is reported to have been placed. Similarly low prices are said to have been quoted on about 5000 tons inquired for by the Pennsylvania Railroad, which probably will be bought this week. Both of these tonnages are for fourth quarter shipment. Otherwise the market has held to \$20.50 for No. 2 plain and \$21 for No. 2X on sales of the week, which included quite a number of moderate size tonnages. A sale of 1000 tons of No. 3 foundry was made at \$20, furnace, and a sale of 20 tons of basic at \$20, furnace, though this latter price is admittedly higher than would apply on a larger tonnage. A steel company which a month or so ago covered its fourth quarter basic requirements now finds it will need more and is about to buy 3000 to 5000 tons. Slowly but surely the pig iron situation, from the producers' point of view, is becoming better, but the opinion of the trade is that no substantial improvement in prices will come until after election.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25	
sil.	\$21.26 to \$22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.63
East. Pa. No. 1X.....	22.26 to 23.13
Virginia No. 2 plain, 1.75 to 2.25	
sil.	28.17 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.67 to 29.17
Basic delivered eastern Pa.....	20.00 to 21.00
Gray forge.....	21.00 to 22.00
Malleable.....	22.00 to 23.50
Standard low phos. (f.o.b. furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace).....	24.00 to 25.00

(Continued on page 738)

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.1.80c. to 1.90c.

Structural Materials

Beams, channels, etc., base, per lb.2.00c.
Sheet piling2.10c. to 2.15c.

Iron and Steel Bars

Soft steel bars, base, per lb.2.00c. to 2.10c.
Soft steel bars for cold finishing.\$3 per ton over base
Reinforcing steel bars, base.2.00c. to 2.10c.
Refined iron bars, base, per lb.2.90c. to 3c.
Double refined iron bars, base, per lb.4.50c.
Stay bolt iron bars, base, per lb.6.50c. to 7.00c.

Hot-Rolled Flats

Hoops, base, per lb.2.60c.
Bands, base, per lb.2.40c. to 2.50c.
Strips, base, per lb.2.25c. to 2.40c.

Cold-Finished Steel

Bars and shafting, drawn or rolled, base, per lb.2.70c.
Bars and shafting, drawn or rolled, l.c.l. per lb.2.95c.
Shafting, turned and polished, base, per lb.2.70c.
Bars, S. A. E. Series, No. 2100.4.25c. to 4.50c.
Bars, S. A. E. Series, No. 2300.6.00c.
Bars, S. A. E. Series, No. 3100.4.90c. to 5.00c.
Strips, base, per lb.4.00c. to 4.25c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg.\$2.80
Galvanized nails, 1 in. and over.\$2.25 over base
Galvanized nails, less than 1 in.2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.\$2.55
Annealed fence wire, base, per 100 lb.2.70
Spring wire, base, per 100 lb.3.50
Galvanized wire No. 9, base, per 100 lb.3.15
Galvanized barbed, base, per 100 lb.3.50
Galvanized staples, base, per keg.3.25
Painted barbed wire, base, per 100 lb.3.25
Polished staples, base, per keg.3.25
Cement coated nails, base, per count keg.2.20
Woven fence (to jobbers) 726-12½-12, per 100 rods.18.70
Woven fence (to retailers) 726-12½-12, per 100 rods.20.03
Bale ties, carloads to jobbers. 75, 5, 5 and 2½ per cent off list

Bolts and Nuts

Machine bolts, small rolled threads, 60 and 20 per cent off list
Machine bolts, all sizes, cut threads. 60 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads 60 and 10 per cent off list
Carriage bolts, cut threads, all sizes. 60 per cent off list
Hot-pressed nuts, blank or tapped, square. 4.50c. off list
Hot-pressed nuts, blank or tapped, hexagons. 4.50c. off list
C.p.c. and t. square or hex. nuts, blank or tapped. 4.50c. off list
Eagle carriage bolts. 65, 10 and 10 per cent off list
Flow bolts. 50, 10 and 5 per cent off list
Semi-finished hex nuts:
¼ in. and smaller, U. S. S.80, 10, 10 and 5 per cent off list
½ in. and larger, U. S. S.75, 10, 10 and 5 per cent off list
Small sizes, S. A. E.80, 10, 10 and 5 per cent off list
S. A. E., ½ in. and larger.80, 10 and 5 per cent off list
Stove bolts in packages.80, 10 and 5 per cent off list
Stove bolts in bulk.80, 10, 5 and 2½ per cent off list
Tire bolts.60 and 10 per cent off list
Bolt ends with hot pressed nuts.60 and 10 per cent off list
Bolt ends with cold pressed nuts.50 and 10 per cent off list
Turnbuckles, with ends, ½ in. and smaller, 55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller, 70 and 10 per cent off list
Washers.5.75c. to 6.00c.
Lock washers.80 per cent off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

Per 1000		Per 1000	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
¼-in.	\$4.25	¼-in.	\$13.25
½-in.	4.90	½-in.	16.25
¾-in.	5.90	¾-in.	22.50
1-in.	7.50	1-in.	34.00
1½-in.	9.75	1½-in.	53.00

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws.85 per cent off list
Milled standard set screws, case hardened.85 per cent off list
Milled headless set screws, cut thread.85 per cent off list
Upset hex. head cap screws, U. S. S. thread.85 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread.85 and 10 per cent off list
Milled studs.80 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.\$2.60
Small rivets.70, 10 and 5 per cent off list

Track Equipment

Spikes, ½ in. and larger, base, per 100 lb.\$2.80
Spikes, ½ in. and smaller, base, per 100 lb.3.25
Spikes, boat and barge, base, per 100 lb.3.25
Track bolts, all sizes, base, per 100 lb.3.75
Track bolts, heat-treated, base, per 100 lb.4.25
Tie plates, per 100 lb.\$2.40 to 2.50
Angle bars, base, per 100 lb.2.75

Welded Pipe

Butt Weld

Steel		Iron	
Inches	Black	Inches	Black
¼ to ¾	45	¼ to ¾	+11
¾ to 1	51	¾ to 1	22
1 to 1½	56	1 to 1½	28
1½ to 2	60	1½ to 2	30
2 to 3	62	2 to 3	30

Lap Weld

Steel		Iron	
Inches	Black	Inches	Black
¼ to ¾	45	¼ to ¾	+11
¾ to 1	51	¾ to 1	22
1 to 1½	56	1 to 1½	28
1½ to 2	60	1½ to 2	30
2 to 3	62	2 to 3	30

Butt Weld, extra strong, plain ends

Steel		Iron	
Inches	Black	Inches	Black
¼ to ¾	41	¼ to ¾	+61
¾ to 1	47	¾ to 1	+54
1 to 1½	53	1 to 1½	21
1½ to 2	58	1½ to 2	28
2 to 3	60	2 to 3	30

Lap Weld, extra strong, plain ends

Steel		Iron	
Inches	Black	Inches	Black
¼ to ¾	41	¼ to ¾	+61
¾ to 1	47	¾ to 1	+54
1 to 1½	53	1 to 1½	21
1½ to 2	58	1½ to 2	28
2 to 3	60	2 to 3	30

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ points, with supplementary discount of 5 per cent.

Boiler Tubes

Lap Welded Steel		Charcoal Iron	
Inches	Black	Inches	Black
2 to 2½	27	1½ in.	+18
2½ to 3	37	1½ to 1¾	+8
3 to 3½	40	2 to 2½	—2
3½ to 4	42½	2½ to 3	—7
4 to 4½	46	3½ to 4	—9

Beyond the above discounts, 2 fives and 2½ per cent extra are given on lap welded steel tubes and 3 fives on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
Inches	Black	Inches	Black
1 in.	55-58	3 and 3½ in.	36-39
1½ in.	47-50	3½ and 4 in.	37-40
2 in.	31-34	4 in.	41-44
2 and 2½ in.	22-25	4½ in. and 5 in.	33-37
2½ in.	32-35		

Hot Rolled

Cold Drawn		Hot Rolled	
Inches	Black	Inches	Black
3 and 3½ in.	38-41	4 in.	43-46
3½ in. and 4 in.	39-42		

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.87 per cent off list
Carbon 0.30 to 0.40, base.85 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
Inches	Black	Inches	Black
2-in. O.D. 12 gage.	15	2½-in. O.D. 10 gage.	20
2-in. O.D. 11 gage.	16	3-in. O.D. 7 gage.	35
2-in. O.D. 10 gage.	17	1½-in. O.D. 9 gage.	15
2½-in. O.D. 12 gage.	17	5½-in. O.D. 9 gage.	55
2½-in. O.D. 11 gage.	18	5½-in. O.D. 9 gage.	57

Tin Plate

Standard cokes, per base box.\$5.50

Terne Plate

(Per Package, 20 x 28 in.)

Cents per Ft.		Cents per Ft.	
Inches	Black	Inches	Black
8-lb coating, 100 lb. base.	\$11.00	20-lb. coating I. C.	\$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.2.60c. to 2.70c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.3.40c. to 3.50c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.4.75c.

Galvanized

No. 28 (base), per lb.4.50c. to 4.60c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.4.95c. to 5c.

Tin-Mill Black Plate

No. 28 (base), per lb.3.40c. to 3.50c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	\$5.65
Old range non-Bessemer, 51½ per cent iron.....	4.90
Mesabi Bessemer, 55 per cent iron.....	5.40
Mesabi non-Bessemer, 51½ per cent iron.....	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	42c.
Manganese ore, Brazilian or Indian, nominal Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	42c.
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	\$8.00 to \$8.50
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York.....	18.50 to 24.00
	80c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$90.00 to \$100.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	92.50 to 95.00
Ferrosilicon, 50 per cent, delivered.....	72.00 to 75.00
Ferrosilicon, 75 per cent.....	140.00
Ferrotungsten, per lb. contained metal.....	87c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr, per lb. contained Cr, delivered.....	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr, per lb.....	10.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobalt, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$31.00 to \$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....	30.00 to 32.00
Ferrosilicon, Bessemer, 10 per cent, \$39.50; 11 per cent, \$42; 12 per cent, \$44.50; 14 to 16 per cent (electric furnace), \$36.00.	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent, \$29.00; 8 per cent, \$30.50; 9 per cent, \$32.50; 10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent, \$39.50.	

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	\$18.00 to \$19.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	19.00 to 20.00
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania	High Duty \$40.00 to \$43.00 Moderate Duty \$36.00 to \$40.00
Maryland	45.00 to 47.00 40.00 to 42.00
Ohio	40.00 to 43.00 37.00 to 39.00
Kentucky	42.00 to 43.00 37.00 to 39.00
Illinois	37.00 to 42.00
Missouri	42.00 to 45.00 35.00 to 40.00
Ground fire clay, per net ton.....	6.00 to 7.00
Silica Brick:	
Pennsylvania	35.00
Chicago	44.00 to 45.00
Birmingham	50.00
Ground silica clay, per net ton.....	7.50 to 8.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	45.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$36.00 to \$37.50
Rolling billets, 2-in. and under.....	37.00 to 37.50
Forging billets, ordinary carbons.....	41.00 to 43.00
Sheet bars, Bessemer	37.00 to 38.00
Sheet bars, open hearth.....	37.00 to 38.00
Slabs	36.00 to 37.50
Wire rods, common soft, base, No. 5 to ¾-in.....	46.00
Wire rods, common soft, coarser than ¾-in...\$2.50 over base	
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.....	2c.
Skelp, sheared, per lb.....	2c.
Skelp, universal, per lb.....	2c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton.....	\$43.00
Rails, light, new steel, base, lb.....	1.85c. to 1.90c.
Rails, light, rail steel, base, per lb.....	1.65c. to 1.75c.
Bars, common iron, base, per lb., Chicago mill	2.15c.
Bars, common iron, Pittsburgh mill.....	2.40c.
Bars, rail steel reinforcing, base, per lb....	2.10c. to 2.15c.
Rail steel bars, base, per lb., Chicago mill....	2c.
Cold-finished steel bars, base, Chicago, per lb.	2.70c.
Ground shafting, base, per lb.....	3.20c.
Cut nails, base, per keg.....	\$2.90

Alloy Steel

S. A. E. Series	Bars 100 lb.
2100* (¾% Nickel, 10 to 20 per cent Carbon) ..	\$3.00 to \$3.25
2300 (3½% Nickel)	4.75
2500 (5% Nickel)	6.00 to 6.50
3100 (Nickel Chromium)	3.65 to 3.75
3200 (Nickel Chromium)	5.50 to 5.75
3300 (Nickel Chromium)	7.25 to 8.00
3400 (Nickel Chromium)	6.50 to 7.00
5100 (Chromium Steel)	3.50 to 3.75
5200* (Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.50
6100 (Chromium Vanadium spring steel).....	4.25 to 4.50
9250 (Silicon Manganese spring steel).....	3.50 to 3.75
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	4.25 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	3.75 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality, per 100-lb., f.o.b. Pittsburgh. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb:

Philadelphia, domestic.....	\$0.32	Buffalo	\$0.265	Kansas City	\$0.735	*Pac. Coast, ship plates	\$1.20
Philadelphia, export.....	0.235	Cleveland	0.19	Kansas City (pipe)...	0.705	Birmingham	0.58
Baltimore, domestic... ..	0.31	Youngstown	0.095	St. Paul	0.60	Memphis	0.66
Baltimore, export.....	0.225	Detroit	0.29	Omaha	0.725	Jacksonville, all rail..	0.70
New York, domestic... ..	0.34	Cincinnati	0.29	Omaha	0.705	Jacksonville, rail and water	0.415
New York, export.....	0.255	Indianapolis	0.31	†Denver (pipe)	1.17	New Orleans	0.67
Boston, domestic.....	0.365	Chicago	0.34	*Pacific Coast	1.15		
Boston, export.....	0.255	St. Louis	0.43				

*Applied minimum carload 30,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets, No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Sept.	Copper, New York		Straits Tin (Spot)		Lead		Zinc	
	Lake	Electrolytic*	New York	New York	New York	St. Louis	New York	St. Louis
10.....	13.50	13.12½	50.62½	8.10	7.95	6.52½	6.17½	
11.....	13.62½	13.12½	50.75	8.10	7.90	6.55	6.20	
12.....	13.50	13.12½	50.00	8.10	7.85	6.57½	6.22½	
13.....	13.50	13.12½	8.10	7.90	6.57½	6.22½	
15.....	13.50	13.00	48.87½	8.10	7.95	6.60	6.25	
16.....	13.50	13.00	47.00	8.10	7.95	6.60	6.25	

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Sept. 16.

Pronounced weakness in tin, both in the London and New York markets, has had some influence on other metals here and quotations except for lead and zinc are lower. The zinc market is considerably stronger than a week ago and lead is fairly firm.

Copper.—Most sellers say that there is no market, buying being of very small proportions, hardly enough to establish prices. This is one consequence of the heavy buying in the last month or two. The market is also under such conditions more susceptible to price changes in London, which were again lower today. In such circumstances consumers who might buy under advantageous conditions are holding back and looking for lower prices. The larger producers are comfortably sold, some of them unwilling to do business at less than 13.37½c., delivered, many of them having done a good business at this level and higher. Some of the custom smelters, operators and speculators are shading this price and some light sales have been made as low as 13.25c., delivered, with some transactions undoubtedly done today at 13.12½c. Some sellers argue that copper is cheap at this price and are optimistic as to future prices and better buying. They also point to the recently published figures of the tremendously heavy consumption in this country this year which surpasses all records and of the exceedingly large exports. Lake copper is quoted at 13.50c., delivered.

Tin.—The week has been a quiet one and at times the market has been exceedingly dull. Some sellers point to conditions as very unsatisfactory. On some days, after a limited business transacted in the forenoon, sales in the latter part of the day could only be made at a sacrifice of prices. For instance, on one day the metal sold at 50.62½c. to 50.50c. in the morning, closing at 50.12½c. The feature of the week, particularly yesterday and today, has been the very sharp decline in London, followed, of course, by large recessions here. Yesterday London prices declined £8 10s., followed by another decline today of £9 per ton. Quotations today were £26 10s. less per ton than they were on Sept. 1. This movement is due largely to the speculations of a leading operator in the London market and to other sellers. Today spot standard was quoted in that market at £231 15s., future standard at £234 and spot Straits at £232 10s., all about £19 per ton less than a week ago. The Singapore price yesterday was £242, down £12 from last week. Market opinion recently has been divided between those who were bears on the immediate future and bulls on the far future trend of the market, with the other side taking the opposite opinion. The course of the market yesterday and today seems to bear out predictions of the former. Sales of 800 tons for the week ended Friday, Sept. 12, are returned as the estimate, with buying yesterday and today fairly light, consumers predominating today. Spot Straits tin is quoted at 47c., New York, at the close today. Arrivals thus far this month have been 3130 tons, with 4760 tons reported afloat.

Lead.—The general situation has changed but slightly since a week ago. The market continues very quiet because sellers are well sold and buyers well bought, and there is not enough business to swing the market up or down. If any change takes place in the

immediate future it will probably be a weakening in the St. Louis position, according to well-informed opinion. The leading interest continues to quote 8c., New York, as its contract price, with the outside market standing at 8.10c., New York, or 7.95c., St. Louis. In the last week the St. Louis price eased off, but is now back to its former level.

Zinc.—This is the only market which has risen sharply in the last week and prices today are about 10 points higher than a week ago. Prime Western is quoted fairly firm at 6.25c., St. Louis, or 6.60c., New York. The advance has been due largely to expanding sales for export, but demand from domestic consumers has been small. Statistics for August reveal an increase in stocks for the month, showing a supply on hand equal to five or six weeks' consumption. This is really not a large surplus, should business pick up considerably.

Nickel.—Wholesale lots of shot and ingot nickel are quoted at 27c. to 28c. per lb., with electrolytic nickel held at 32c. by the leading producers.

Antimony.—Firmness still characterizes this market, due to the civil war in China, but there is not much demand here from consumers. Spot metal is quoted at 11c., duty paid, New York.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted by importers at 27c. to 28c. per lb., duty paid, delivered.

Old Metals.—Prices are generally unchanged and business is quiet. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	13.00
Copper, heavy and wire	12.00
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.50
Brass, light	7.00
No. 1 red brass or composition turnings..	9.25
No. 1 yellow rod brass turnings	8.00
Lead, heavy	7.37
Lead, tea	6.25
Zinc	4.25
Cast aluminum	17.00
Sheet aluminum	17.00

Chicago

Sept. 16.—All of the metals are dull and, with the exception of antimony, prices are weaker, tin and zinc having actually declined. Old metal prices are unchanged but softer. We quote in carload lots: Lake copper, 13.75c.; tin, 50c.; lead, 7.95c.; spelter, 6c.; antimony, 12.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9c.; red brass, 8.25c.; yellow brass, 7c.; lead pipe, 7c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 32c.; block tin, 40c., all buying prices for less than carload lots.

Thousands of Tons of Galvanized Sheets to Stop Locusts

Reference was made recently in THE IRON AGE's market pages to the order taken by the United States Steel Products Co. for 39,000 tons of galvanized steel sheets for shipment to the Argentine, there to be used in an effort to stop the ravages of locusts in agricultural sections. Sheets for this purpose have been used experimentally, but this is the first order for any considerable tonnage. The purchase was made by the Department of Agriculture of the Argentine Government and the sheets will be distributed to farmers, who will erect them in the form of fences to be used as barriers against locusts. British manufacturers of galvanized sheets, who are ordinarily large shippers to South American markets, were active competitors for the contract.

Buck, Kiaer & Co., 9 East Forty-sixth Street, New York, importers of raw materials for the steel industry, have been appointed United States agents for fluorspar of George G. Blackwell Sons & Co., Liverpool, England, the first miners and shippers of English fluorspar to this country. Mr. Buck of Buck, Kiaer & Co. formerly represented the British America Nickel Corporation in this country.

PERSONAL

J. W. Blackford, formerly assistant to the president of the Consolidated Machine Tool Corporation, Rochester, N. Y., having held the same position previously with the Dale Machinery Co., New York, has become connected with the Torrington Co., Torrington, Conn. He will handle sales of the Dayton swager and Torrington ball bearing.

F. R. Hopper, western manager for the Concrete Steel Co., Chicago, has been transferred at his own request to Kansas City, Mo., where he will be district manager in charge of the company's business in Nebraska, Kansas, Oklahoma, western Iowa and western Missouri. C. A. Lord, district manager at Kansas City, has been transferred in the same capacity to Chicago. The position of western manager has been eliminated and the Chicago, St. Paul and Kansas City district sales offices will report direct to the general offices at New York. The Omaha branch office will report to the Kansas City district sales office.

W. P. Hammond, 1987 Railway Exchange Building, St. Louis, has resigned as St. Louis district representative of Briggs & Turivas, Chicago.

C. B. Peterson, formerly with Hill, Clarke & Co., Inc., Boston, has again become associated with that firm. His territory will be southern Massachusetts and Rhode Island.

Lockett C. Coleman, assistant general manager Boston & Maine Railroad, Boston, has resigned to accept a position with the locomotive department of the Ingersoll-Rand Co., New York.

L. H. Beyer, formerly purchasing agent, has been named secretary of the manufacturing department, American Radiator Co., at Buffalo. He is succeeded by Edward L. Dalton, formerly traffic manager in Chicago. Mr. Dalton's headquarters will be in Buffalo.

Louis W. Byrne, formerly with Wilmarth & Morman Co., Grand Rapids, Mich., has been appointed general manager of the Delahunty Dyeing Machine Co., Pittston, Pa.

L. W. Klein of Pottsville, Pa., has become vice-

president of the Green Engineering Co., East Chicago, Ind.

Clayton S. Berry, formerly manager of the Keasby & Mattison Co., has been made president of the Berry Asbestos Co., Atlanta, Ga.

Sir Charles A. Parsons, London, England, inventor of the steam turbine, visited Milwaukee on Sept. 11 and was the guest of Otto H. Falk, president, and Max W. Babb, vice-president of the Allis-Chalmers Mfg. Co., which for 20 years has been a licensee of the Parsons patents.

Dr. Henry A. Burd, formerly general manager of the Wisconsin Tractor Co., Sauk City, Wis., and a former instructor in the University of Wisconsin, Madison, has accepted the chair of business administration in the University of Washington, at Seattle. He is a graduate of the University of Illinois.

Manning, Maxwell & Moore, Inc., New York, announces changes in personnel as follows: Percy M. Brotherhood is consulting engineer and Frank J. Baumis is vice-president in charge of the machinery department, both being located at 100 East Forty-second Street, New York. Augustus Wood becomes works manager of the Putnam Machine Co., Fitchburg, Mass.

Peter F. Haberstick has been appointed director of safety for the Wheeling Steel Corporation and temporarily will make headquarters at the Benwood plant. He has been in the purchasing department of the corporation.

Charles L. Winn has joined the Mossberg Pressed Steel Corporation, Attleboro, Mass., as sales executive, and will supervise the company's activities in the textile industries of New England. He is an alumnus of the Lowell Textile School.

G. R. Horne has been appointed district sales manager, magnet department, at Detroit, for the Ohio Electric & Controller Co., Cleveland. His headquarters will be at 2158 Penobscot Building.

C. A. Brown, who for several years was connected with Bishop, Friedman & Bergstrom, Philadelphia scrap dealers, has become associated with Hiram Winternitz in the Philadelphia office of Charles Dreifus & Co., Pittsburgh scrap firm.

OBITUARY

RICHARD B. CHARLTON, whose death on Sept. 5 was announced in THE IRON AGE of Sept. 11, was born at Spuyten Duyvil, N. Y., Oct. 10, 1864. He was a graduate of the public schools and the City College of Baltimore, and the Rensselaer Polytechnic Institute, Troy, N. Y. For a number of years after leaving college, Mr. Charlton was connected with the R. W. Hunt Co. and in October, 1892, he was employed in the mill of the Illinois Steel Co. at Milwaukee. He was promoted to mill foreman in 1893, and four years later was appointed assistant general superintendent. He was advanced to general superintendent in 1903, and remained in that position until his death. Mr. Charlton was interested in public affairs and was a director of the Milwaukee Public School Board for eight years, during



R. B. CHARLTON

which time he rendered valuable service in the interest of education.

FRANK F. DRESSER, Worcester, Mass., general counsel for the Associated Industries of Massachusetts, and recognized nationally as an authority on workmen's compensation and other laws governing the relations of employer and employee, died Sept. 9, aged 51 years. Mr. Dresser was born in Southbridge, Mass., was graduated from Harvard University in 1894 and, completing two years at Harvard Law School, was admitted to the bar in 1897. He was a member of the law firm of Smith, Gage & Dresser and for several years was counsel at Worcester for the American Steel & Wire Co. Several times he was offered a judgeship of the Massachusetts Superior Court. He had delivered addresses on his specialized subjects before various of the great associations of industrial employers.

W. BENJAMIN WATKINS, for more than 30 years head of the New York Car Wheel Works, Buffalo, died last week at his lake shore home. Starting with the Michigan Central Railroad in Canada, when that road was in the making, he soon afterward became master mechanic at St. Thomas, Ont., and advanced until he was named in charge of the New York Car Wheel Works. In 1917 he organized the Watkins Commercial Body Corporation, of which he had been president until the time of his death.

WILLIAM J. MCGOWAN, superintendent of docks at the South Works of the Illinois Steel Co., Chicago, died of heart failure in that city on Sept. 6. He was born in 1868 and first entered the company's employ at South Works in May, 1898, as a steel charger in the plate

mill. He was subsequently a timekeeper and in 1904 was appointed assistant superintendent of docks. In 1907 he was promoted to superintendent of docks, the position he held until his death.

GEORGE P. EARLY, special agent for the American Sheet & Tin Plate Co., Pittsburgh, died at his home in that city on Sept. 13. His health had been failing for several years, but he had been able to attend to his duties until a few weeks ago. Of a humorous turn of mind, "Judge" Early, as he was addressed by intimates, was popular as an after dinner speaker and he also was a writer of ability in humor and satire. He was born in West Alexandria, Ohio, 68 years ago. In his younger days he taught school at Eaton, Ohio, and later became associated with Garr, Scott & Co., implement manufacturers, Richmond, Ind. In 1901 he went to New York to accept a position with Daniel G. Reid, then head of the American Tin Plate Co. Later Mr. Early was employed in the claim department of that company and upon its consolidation with the American Sheet Steel Co. in 1904 into the present American Sheet & Tin Plate Co. he became special agent of the new company and removed to Pittsburgh. He was a member of the American Iron and Steel Institute, the Duquesne Club, Pittsburgh, and the Masonic fraternity.



G. P. EARLY

FELIX KAHN, pioneer stove manufacturer, philanthropist and president of the Estate Stove Co., Hamilton, Ohio, died at his home in Cincinnati on Sept. 10. He was born in Ingweiler, Alsace, France, and emigrated with his parents to South America. He later went to Cincinnati, where he lived more than half a century.

MOSES EHRLICH, who was engaged in the old material business at Springfield, Mass., for many years, died suddenly in his office Sept. 12, in his sixty-fourth year.

Iron and Steel Markets

(Concluded from page 733)

Ferroalloys.—Almost no business in ferromanganese is being done. The leading domestic producer maintains its quotation of \$100, furnace, while agents of British producers continue to quote \$95, seaboard.

Billets.—Nominally the market prices of billets remain unchanged, namely, \$37 for rerolling quality and \$42 for forging quality, but the attitude of the mills is to make each inquiry the subject of special negotiation. With plates, shapes and bars ranging in price from \$32 to \$40 per net ton, it is obvious that there are few buyers willing to pay \$37 for billets.

Plates.—No improvement has developed in the plate situation. On the score of prices the situation is worse for the mills because prices on the larger lots have now definitely settled to 1.60c., Pittsburgh, while even on small lots it is difficult to obtain more than 1.65c. Orders have not increased sufficiently to give mills better rolling schedules, though one mill is operating at a full rate this week. Some of the Eastern mills hope to benefit by the placing of orders for 3000 cars by the Reading. This order will probably be awarded this week and some of the cars may be built in the East.

Structural Shapes.—The City of Philadelphia has asked for bids on the second section of the Broad Street subway, which will require about 9000 tons of fabricated steel, the first section, about 10,000 tons of steel, having been awarded to the McClintic-Marshall Co. in mid-

summer. The building of the Penn Athletic Club, requiring 5000 tons of steel, which has been in doubt for some time, is now definitely assured through the awarding of the general contract, but the steel award has not been announced. Structural shapes continue weak, 1.90c., Pittsburgh, now being the going market price on anything from 100 tons upward. It is only on smaller lots that higher prices are obtained, and then seldom above 2c., Pittsburgh. There is a fair number of small projects for fabrication in the market, but generally the demand for shapes is lighter than it was a month ago.

Bars.—In an effort to stimulate railroad buying, quotations of 2c., Pittsburgh, were made on steel bars, and this has resulted in a general weakening of prices. On larger lots 2c. will now be quoted by some mills, though a few still adhere to 2.10c. Concrete bars were the first to weaken, it now developing that sales had been made at 2c., while merchant bars were still fairly firm at 2.10c. Eastern bar iron markets have tried to stiffen the bar iron price, and in some instances have quoted 2.05c., Pittsburgh, but with what success is not apparent. Most of the business of the past week was at 2c.

Warehouse Business.—For some time prices of steel out of stock have been irregular, some jobbers quoting lower than others. The following list of prices for local delivery has been revised downward from 10c. to 50c. per 100 lb.:

Soft steel bars and small shapes, 3.10c.; iron bars (except bands), 3.10c.; round edge iron, 3.30c.; round edge steel, iron finished, 1½ x ¼ in., 3.35c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.10c.; tank steel plates, ½ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.75c.; black sheets, No. 28 gage, 4.75c.; galvanized sheets, No. 28 gage, 5.85c.; square twisted and deformed steel bars, 3.10c.; structural shapes, 3.10c.; diamond pattern plates, ¼ in., 5.30c.; ½ in., 5.50c.; spring steel, 4.50c.; round cold-rolled steel, 4.05c.; squares and hexagons, cold-rolled steel, 4.55c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.10c.; narrower than 1 in., all gages, 4.60c.; steel bands, No. 12 gage to ¼ in., inclusive, 3.85c.; rails, 3.35c.; tool steel, 8.50c.; Norway iron, 6.75c.

Old Material.—With substantially higher prices at Pittsburgh, the Eastern scrap market is stronger. One Eastern mill last week bought several thousand tons at \$18, delivered. In the past two weeks fully 30,000 to 40,000 tons has been bought by mills of this district, and with one exception, a lot of 15,000 tons, \$18 has been paid in nearly all instances. No sales have been made in the past week at less than \$17.50. Other grades have not materially changed, though the views of brokers on prices have been considerably changed by the greater strength at Pittsburgh, and sales during the coming week are apt to be at advancing prices.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$17.50 to \$18.00
Scrap rails	17.50 to 18.00
Steel rails for rolling.....	19.00 to 19.50
No. 1 low phos., heavy 0.04 and under	21.00 to 21.50
Couplers and knuckles	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
Cast-iron car wheels	18.00 to 18.50
No. 1 railroad wrought	19.00 to 20.00
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.00 to 14.50
Mixed borings and turnings (for blast furnace use)	12.50 to 13.00
Machine shop turnings (for steel works use)	14.00 to 14.50
Machine shop turnings (for rolling mill use)	14.00 to 14.50
Heavy axle turnings (or equivalent)	16.50 to 17.00
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	16.00 to 16.50
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel plants)	17.00 to 17.50
Railroad grate bars	15.50 to 16.00
Stove plate (for steel plant use)	15.50 to 16.00
Wrought iron and soft steel pipes and tubes (new specifications)	17.00 to 17.50
Shafting	25.00 to 26.00
Steel axles	24.00 to 25.00

Imports.—Included in the imports at this port in the past week were the following: Iron ore from Sweden, 13,587 tons; iron ore from French Africa, 5257 tons; manganese ore from British India, 1500 tons; chrome ore from Portuguese Africa, 4500 tons; round iron, Netherlands, 61 tons; ferromanganese from England, 100 tons.

Machinery Markets and News of the Works

NO GAIN IN BUSINESS

Machine-Tool Markets Generally Dull, Though Improvement May Lie Ahead

Trade Disappointed, However, at the Slowness with Which Buying Is Developing

Although the machine-tool trade continues to hope that improvement lies ahead, it is unable to report any marked gain in buying this month. There is keen disappointment on every hand at the slowness with which expected fall buying has developed.

In some sections inquiries have increased in number, but these are nearly all for single machines and give no promise of expansion of business on a scale that would give machine-tool plants better working schedules.

Bookings of machine tools in August represented 19.3 per cent of the rate at which orders were received in the first quarter of 1920, according to the records of the National Machine Tool Builders' Association. This index compares with 17.5 for July and 16.2 for June. With June as the low point of the year, August shows nearly 20 per cent improvement.

New York

NEW YORK, Sept. 16.

NO marked change for the better has developed in the local machine-tool trade since the first of the month, though some dealers report a slight increase in the number of inquiries. These, however, do not involve any purchases of size, being mostly for single machines from scattered sources. Among the more important orders which have come to local offices the past week are the following: Carnegie Steel Co., Pittsburgh, 27-in. x 25-ft. engine lathe; Atchison, Topeka & Santa Fe Railroad, a car wheel lathe; Southern Pacific, a 10-ft. pneumatic plate flanging clamp; Vilter Mfg. Co., Milwaukee, a 36-in. x 18-ft. engine lathe; Wyman-Gordon Co., Harvey, Ill., two used steam drop hammers of 12,000-lb. capacity.

The Freed-Eisemann Radio Corporation is preparing to meet the demand for its new line of neodyne receivers by taking on another floor of the Sperry Building, Brooklyn, which will provide 17,000 additional sq. ft. of factory space.

The Duplex Motion Picture Industries, Inc., 1819 Broadway, New York, manufacturer of motion picture machines and equipment, has purchased a six-story building at Sherman Street and Harris Avenue, Long Island City, totaling 40,000 sq. ft., with one-story structure adjoining and vacant land running through to Marlon Street. The new owner will remodel the existing factories for a new plant, with plans for the early erection of an addition.

The New South Wales Government Railways and Tramways, Sydney, Australia, will take bids until Oct. 15 for one 20,000 kw. turbo-alternator for its White Bay electric generating plant.

The Consolidated Gas Co., 130 East Fifteenth Street, New York, will erect a one-story repair shop and transformer house, 180 x 285 ft., at 153d Street and Cromwell Avenue, estimated to cost \$200,000 with equipment, for which plans have been prepared by William C. Morris, architect, company address.

The State Electricity Commission, Melbourne, Victoria, Australia, will take bids until Dec. 1 for 66,000-volt trans-

formers, induction regulators and other electric power apparatus, specification 24/88; also for a quantity of cable and accessories for the Yallourn power scheme, specification 24/90, until Nov. 24. Specifications on file at the offices of the Bureau of Foreign and Domestic Commerce, 734 Custom House, New York, and Room 830, 76 West Monroe Street, Chicago.

M. B. Adler, 236 West Fifty-sixth Street, New York, architect, has plans for a two-story automobile service, repair and garage building, 60 x 100 ft., at 2552-6 Bedford Avenue, Brooklyn, to cost \$65,000.

The National Railways of Mexico, Mexico, have preliminary plans for rebuilding their shops at Aguascalientes, recently destroyed by fire with loss approximating \$500,000, including equipment.

The General Gas & Electric Corporation, 50 Pine Street, New York, operated by W. S. Barstow & Co., Inc., is disposing of an additional preferred stock issue of \$1,515,000, the proceeds to be used for expansion in hydroelectrical generating plants in South Carolina and other power development. The company controls the South Carolina Gas & Electric Co., the Columbia Railway, Gas & Electric Co., and the Parr Shoals Power Co., all of South Carolina.

The city of New York, Armory Board, Municipal Building, has plans for improvements in the balcony at the armory at 111 West Fourteenth Street, to provide for a machine shop, forge and electrical shop. The building work, exclusive of tools and mechanical equipment, will cost \$20,000. William M. Halley, 2208 Municipal Building, is architect.

The Glidden Buick Corporation, 239 West Fifty-eighth Street, New York, has acquired a five-story building, 190 x 200 ft., at 3261-75 Broadway, for \$600,000, and will establish a service, repair and parts works. The company represents the Buick automobile.

The State Hospital Commission, Albany, N. Y., is completing plans for an addition to the power house at the State hospital, Kings Park, N. Y., to cost \$200,000 including equipment.

The Industrial Machinery Division, Room 320, Bureau of Foreign and Domestic Commerce, Washington, has received an inquiry from Chile for information and quotations on American machinery for handling, grinding and washing sugar cane for a proposed mill of 600 tons per day capacity; also on like equipment for a mill of one-half this output, to be operated 24 hr. per day during the grinding season; and for machinery for a by-products alcohol plant. Catalogs, etc., should be addressed to the bureau, marked "For Transmission to the office of the Commercial Attaché, Santiago, Chile." Ralph H. Ackerman, commercial attaché, has information regarding the project.

The Ballwood Co., 30 Church Street, New York, manufacturer of pipe flanges, pipe bends, etc., has plans for a one-story foundry addition at its plant at Clifton, N. J., 45 x 172 ft., to cost \$25,000. W. G. Pattison, 625 Main Avenue, Clifton, is architect.

The Union Smelting & Refining Co., Avenue L and St. Charles Street, Newark, N. J., will begin the erection of two one-story foundries estimated to cost \$80,000 and \$40,000 respectively including equipment.

The Crane Co., 836 South Michigan Avenue, Chicago, has awarded a general contract to Edward M. Waldron, Inc., 27 Central Avenue, Newark, for the erection of its proposed one-story and basement factory branch and distributing works, 50 x 100 ft., at 432-26 Mulberry Street, to cost approximately \$130,000. J. H. and W. C. Ely, Fireman's Building, Newark, are architects.

The Public Service Electric & Gas Co., Newark, has arranged an appropriation of \$7,500,000 for current construction and improvements, primarily for the distribution department, including the erection of 14 new automatic power substations, extensions and betterments in four existing substations, purchase and installation of about 100,000 ft. of transmission cable, and other work. Improvements will be made in the power plant at Fernwood, near Trenton, N. J., and additional equipment installed, and a new automatic power substation constructed in this district.

Fire, Sept. 8, destroyed the plant of the Newark Woodworking Co., Inc., 345 Thomas Street, Newark, with loss estimated at \$50,000 including machinery. Plans for rebuilding are said to be under consideration. Carl Goldberg is president.

H. Dieterle, Cedar Grove, N. J., is in the market for a gasoline engine, 1 to 3 hp., marine or stationary type.

The Emerson Co., 8 Peck Slip, New York, recently incorporated to manufacture wood and metal patterns, now has plant and equipment ready for operation. Casting requirements will be of bronze, iron and aluminum and will be let out to contract. William Emerson is one of the heads.

The Thies Machinery & Process Corporation, 11 East Forty-second Street, New York, organized to manufacture dyeing machines, is looking for a manufacturer of high-pressure steel tanks which is in a position to build these machines. George W. Steiger heads the company.

Philadelphia

PHILADELPHIA, Sept. 15.

A ONE-STORY power house to cost about \$50,000 will be erected by the Union Tank Car Co., 21 East Fortieth Street, New York, at its new car repair and maintenance works at Penrose Avenue and Gallows Lane, Philadelphia, now in course of construction. Building contract has been let to the Hughes, Foulkrod Co., Commonwealth Building.

The Olney Foundry Co., Olney, Philadelphia, will erect a one-story addition at Duncannon and Mascher Streets, estimated to cost \$27,000.

F. N. Geisler, 1035 Walnut Street, Philadelphia, architect, has plans under way for a one-story power house to be erected at a new factory to be located at Sixty-eighth and Upland Streets, for which the owner's name is temporarily withheld. It will cost about \$35,000.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: 42,617, from P. Martinez Areal, Calle Building 223, Havana, Cuba, desirous of getting in touch with American manufacturers of general iron and steel products; 42,610, from the Madras Auto Supply Co., 22 Broadway, Madras, India, desiring to get in contact with American manufacturers of automobile accessories; 42,605, from Benjamin Brothers, Han Frances 12, Saloniki, Greece, interested in the purchase of tobacco machinery, cigarette-making machinery, iron and steel, hardware products, metal castings, wire cloth, tinplate, corrugated sheets, etc.; 42,615, from W. Schendel, Rua das Flores 29, Porto Alegre, Brazil, desiring to get in touch with American manufacturers of barbed wire, iron, tinplate, etc.; 42,607, from the Standard Products Co., Inc., 14 Canton Road, Shanghai, China, interested in the purchase of bolts, nuts, rivets, plumbers' goods, fittings, etc.; 42,613, from Ignacio Ortega, Rivas, Nicaragua, in the market for rope-making machinery; 42,616, from Jose C. Umpierre, P. O. Box 76, Bayamon, Porto Rico, interested in steel forms for concrete construction, wire fencing and netting.

The City Commission, Trenton, N. J., has authorized an appropriation of \$180,000 for the purchase of the plant of the John E. Thropp's Sons Co., Lewis Street, machinist. The works will be developed for a central machine and mechanical repair plant for municipal service.

The City School Board, West King Street, York, Pa., David W. Crider, secretary, has revised plans for a three-story and basement industrial high school at Beaver Street and College Avenue, with complete manual training departments, estimated to cost \$1,000,000. Hamme & Witman, City Bank Building, are architects.

The Central Railroad of New Jersey, 143 Liberty Street, New York, has acquired more than 200 acres on the Lehigh River, Bethlehem, Pa., for new car and locomotive shops. It is proposed to remove the present shops at Ashley, Pa., to the new location and install additional equipment.

The Windsor Motor Co., 20 North Fourth Street, Reading, Pa., has plans for a two-story addition, 40 x 100 ft., to its service, repair and garage building to cost \$40,000 with equipment. H. G. Mohn, Church and Walnut Streets, Mohnton, Pa., is architect.

The Luzerne County Gas & Electric Co., Kingston, Pa., will begin the construction of its proposed steam-operated electric generating plant at Hunlocks, near Shickshinny, Pa., designed for an ultimate capacity of 80,000 kw., with estimated cost of \$5,000,000.

Ernest W. Nietz, 187 Wyoming Avenue, Wyoming, Pa., architect, has completed plans for a two-story automobile service, repair and garage building, 36 x 145 ft., at Pittston, Pa., estimated to cost \$50,000.

The State Welfare Department, Harrisburg, Pa., Dr. Ellen C. Potter, secretary, is arranging for the removal of the metal automobile license tag manufacturing department at the State Reformatory, Huntingdon, to the Western Penitentiary, Pittsburgh, where a building is being erected. At the Huntingdon institution the department will maintain a reserve unit for the manufacture of license tags and purposes to install a foundry, machine shop and

woodworking department for vocational training of the younger inmates.

The Lehigh Valley Railroad Co., 143 Liberty Street, New York, is contemplating the construction of car repair shops on property owned near Bethlehem, Pa., to cost more than \$200,000 with equipment.

The Tipton Foundry Co., Tipton, Pa., is contemplating an addition, 150 x 200 ft., which will be used as an enameling department, giving employment to about 125 additional men.

Electric power equipment, conveying and other machinery will be installed in the two-story and basement printing plant to be erected by the *Pottstown News*, Hanover Street, Pottstown, Pa., estimated to cost \$125,000. A. S. Kepner, 121 North Hanover Street, is architect. W. S. Binder is president.

Fire, Sept. 5, destroyed the major portion of the plant of the Gilhool Wagon Works, North Washington Avenue, Scranton, Pa., with a loss of \$75,000 including equipment. Plans for rebuilding are under consideration. W. E. Gilhool heads the company.

Edward W. Peters, 103 Lower Mulberry Street, Danville, Pa., is in the market for a 30-in. x 12-ft. wood planer, band saw and two boiler feed pumps for 400 hp. boilers.

Chicago

CHICAGO, Sept. 15.

THE local machine tool market has relaxed into dullness. Outside of the Chicago school board list, which still remains unbought, both orders and inquiries are largely for individual machines. The trade, however, is still convinced that improvement lies ahead, although disappointed at the slowness with which it is developing. Encouragement is derived from the large recent purchases of freight cars by the railroads and it is hoped that these will be followed by liberal inquiries for machine shop equipment. Another possibility is better buying by railroad car builders.

The Pullman Car & Mfg. Co., which has been placing orders throughout the summer against a list first issued early in the year, is believed to be concluding its purchases, having placed orders for a 36 x 36-in. x 12-ft. and a 42 x 42-in. x 12 ft. planer. The Fruit Growers Express, Washington, bought a No. 3 milling machine for its Indiana Harbor, Ind., plant. The largest recent buying for this district has been handled at Pittsburgh, where it is reported that machine shop purchases for the Gary Tube Co., Gary, Ind., have been concluded. It is understood that considerable mill equipment is still to be bought. An order has just been placed by that company for two pipe straighteners. The Yeomans Brothers Co., Chicago, has placed orders for a horizontal boring mill, a universal grinding machine and a drill press. The Chicago, Burlington & Quincy is inquiring for two motor-driven two-spindle car box boring machines.

The Rindsberger Mfg. Co., manufacturer of lamp shades, 18 East Twenty-fourth Street, Chicago, is taking bids through Sidney Minchin, Inc., 52 West Jackson Boulevard, on a five-story factory, 120 x 140 ft., of either mill or reinforced concrete construction, at Wabash Avenue near Twenty-fourth Street, to cost \$400,000.

The Walnart Electric Mfg. Co., manufacturer of radio supplies, 1251 West Van Buren Street, Chicago, has purchased a three-story factory at 302-310 South Green Street, and will occupy the entire floor space.

The Savage Brothers Co., manufacturer of confectioners' machinery, 2638 Gladys Avenue, Chicago, has awarded contracts for a one-story plant, 70 x 100 ft., at 2634-36 Gladys Avenue, to cost \$80,000.

The Sanitary District of Chicago has awarded contract for improvements to the Thirty-ninth Street pumping station estimated to cost \$325,000. It also contemplates the erection of a sewage treatment plant at Calumet City to cost \$500,000.

Fire, Sept. 5, destroyed a portion of the machine building and other departments at the plant of the Utica Hydraulic Cement Co., Utica, Ill., with loss estimated at \$85,000, with equipment. It is planned to rebuild.

The Public Service Co. of Colorado, Denver, is disposing of a bond issue of \$10,000,000, a portion of the proceeds to be used for extensions in power plants and systems.

The Russell Grader Mfg. Co., 2037 University Avenue, S. E., Minneapolis, Minn., manufacturer of road and farm machinery, etc., has preliminary plans for a one-story factory in the Industrial District. E. R. Ludwig, Essex Building, is architect.

The Fire Protection Co., Chicago, manufacturer of fire-

fighting equipment, operated by the Kellogg McKay Co., 419 West Eighteenth Street, is taking bids on a general contract for its proposed one-story plant at Cicero, Ill., 160 x 200 ft., estimated to cost 200,000 with machinery.

The Myles Standish Mfg. Co., Council Bluffs, Iowa, manufacturer of spark plugs and kindred specialties, is planning to rebuild the port of its plant destroyed by fire Aug. 29, with loss estimated at \$50,000 including equipment.

The Board of Trustees, Scholastica Academy, 7430 Ridge Boulevard, Chicago, is having plans drawn for a two-story power house and mechanical laundry, 40 x 100 ft., estimated to cost \$55,000. E. Brielmaier & Sons, 432 Broadway, Milwaukee, are architects.

The Smith Oil & Refining Co., Rockford, Ill., has acquired two acres and plans the construction of a new oil storage and distributing works.

The Red Cab & Motor Co., 53 West Jackson Boulevard, Chicago, care of the Charles F. Heinig Co., same address, has plans for a one and two-story service, repair and garage building on Elston Street, 125 x 125 ft., estimated to cost \$80,000. The Carnegie Co., 189 West Madison Street, is architect.

The Gross Metal Products Co., 133-37 Twelfth Street, St. Paul, Minn., recently incorporated with capital stock of \$300,000, contemplates erecting an addition and will be in the market for equipment. No contracts have been let so far. W. J. Cross and A. R. Cross head the company.

New England

Boston, Sept. 16.

MACHINE tool inquiries received two or more weeks ago are still prospects. Sales of both new and used equipment are a rarity. August was one of the dullest months experienced by local dealers, at least in many years, and the first half of September has been even less active than the first half of August. Buyers are frank to admit they are in no hurry to take the initiative. Purchases may be delayed until 1925 and until after election, at any rate. Machine tool houses, however, expect a material improvement in business during the next 15 days. New England metal working plants collectively, are operating on a greater ratio than a month ago but activity is gathering momentum very slowly. Machine tool making plants are for the most part operating with greatly reduced forces and in some instances on a restricted weekly basis. Prices are steady and unchanged.

Walter G. Hall, 191 South Street, Fitchburg, Mass., will erect a one-story, 34 x 60-ft. foundry. Plans are private.

The Armstrong Mfg. Co., Bridgeport, Conn., water, gas and steam valves, will build an addition to its plant on Knowlton Avenue in the near future.

Plans have been made by the Winchester Spring Auto Repair Co., Winchester, Mass., to erect a one-story, 40 x 75 ft., repair shop. Elmer R. B. Chapman, 101 Tremont Street, Boston, is the architect.

The bolt threading machinery plant of the H. B. Brown Co., East Hampton, Conn., was recently destroyed by fire. Charles S. Brown, Nashville, Tenn., is president. The company plans to rebuild, but possibly not on the present site.

Terry & Crawford, Blossom Street, Fall River, Mass., have awarded a contract for a one and two-story, 50 x 140 ft., blacksmith shop. E. M. Corbett, 70 Bedford Street, Fall River, is the architect.

The Draper Corporation, Hopedale, Mass., cotton machinery, has started additions and alterations to its power house and air compressor departments. F. P. Butterworth, manager, is in charge of the work. John A. Stevens, Merrimack Street, Lowell, Mass., is the engineer.

Plans are about completed for a three-story and basement, 40 x 168 ft., and two-story, 80 x 110 ft., elementary school for Boston, containing manual shops, to cost, without mechanical equipment, \$400,000. Thomas P. Glynn, chairman of the school commission, will supervise the school construction. C. Howard Walker & Sons, 120 Boylston Street, Boston, is the architect.

Two units of the Lake Torpedo Boat Co., Bridgeport, Conn., recently sold to Samuel Grossman, Quincy, Mass., have been resold to the Forsberg Mfg. Co., Bridgeport, hardware and hack-saw frames. The purchase includes a machine unit, 80 x 300 ft., a smaller unit, and considerable metal-working equipment.

James H. Wilkins & Co., Carlisle, Mass., have been awarded contract for additions and alterations to the Foster school, Tewksbury, Mass. Plans drawn by J. Williams Beal

The Crane Market

REPRESENTATIVES of crane builders are disappointed in the small number of inquiries received since the first of the month. In fact, there has been almost nothing in the way of new business, the demand being less than it has been at any time in recent months of light buying.

Among recent purchases are:

Walter C. Gahagan, 147 Remsen Street, Brooklyn, 25-ton used Industrial locomotive crane.

The John J. Craig Co., Knoxville, Tenn., a 25-ton American locomotive crane.

The Congoleum Co., Philadelphia, a Niles traveling crane of 6 tons capacity, 33-ft. span.

The Edge Moor Iron Co., Edge Moor, Del., which recently ordered a 10-ton crane, has changed the specifications to a 15-ton riveting tower crane.

Westinghouse Air Brake Co., Wilmerding, Pa., six 3-ton wall cranes, two 5-ton, 51-ft. 1½-in. span, one 5-ton, 37-ft. span, one 5-ton, 33-ft. span and one 3-ton, 33-ft. span overhead crane and a monorail, all from the Shaw Electric Crane Co.

Sons, Boston, provide for a manual training department. Work is to start immediately.

Contract has been let by the Vulcan Iron Works, New Britain, Conn., manufacturer of malleable iron castings, to the Lawrence & Coe Construction Co., 272 Trumbull Street, Hartford, Conn., for its proposed three-story plant, 80 x 275 ft., with L extension, 80 x 100 ft. Max J. Unkelbach, New Britain, is architect.

The Narragansett Electric Lighting Co., Providence, has taken out a permit for the construction of its proposed steam-operated electric generating station on South Street, comprising two units 100 x 107 ft. and 38 x 75 ft., respectively, estimated to cost \$2,500,000 with machinery. Jenks & Ballou, Grosvenor Building, are architects.

Fire, Sept. 11, destroyed a portion of the electric light and power plant of the St. Croix Gas Light Co., Calais, Me., with loss estimated at \$150,000 with equipment. It is planned to rebuild.

H. K. Noyes & Sons, Inc., Hartford, Conn., local representative for the Buick automobile, is having plans drawn for a one and two-story service, repair and garage building, 100 x 350 ft., at 80 Washington Street, estimated to cost \$80,000.

Buffalo

BUFFALO, Sept. 15.

NEGOTIATIONS have been closed by the Consolidated Aircraft Corporation East Greenwich, R. I., for a lease of a portion of the former works of the Curtiss Aeroplane & Motor Corporation, Buffalo, and will remove its business to this location. The company will consolidate the business of the Dayton-Wright Co., Dayton, Ohio, and the Gallaudet Aircraft Corporation, both recently purchased, at the Buffalo works, with the installation of considerable additional equipment. It is purposed to begin operations in October with about 250 employees. Contract has been secured from the Government for airplanes and parts to an amount of about \$500,000. Major R. H. Fleet is president.

The Wiedman Body Co., North Tonawanda, N. Y., will erect a one-story addition to cost \$30,000.

The Niagara Falls Power Co., Niagara Falls, N. Y., is reported to have plans under way for the construction of a hydroelectric generating plant in the vicinity of Lewiston, N. Y., estimated to cost \$1,500,000, with flume for water head, transmission lines, etc.

The American Body Co., 1200 Niagara Street, Buffalo, has leased Building B at the former plant of the Curtiss Aeroplane & Motor Corporation, totaling about 500,000 sq. ft. of floor space, for the establishment of a new plant. The structure is 600 x 900 ft., and will be given over entirely to the new production. The present business will be removed to the site and additional equipment provided to increase the working force by about 300.

The Middleport Gas & Electric Co., Middleport, N. Y., is making ready for foundation and superstructure work for its proposed hydroelectric generating plant on the Eighteen Mile Creek Gorge, near Burt, N. Y., estimated to cost \$300,000 with equipment.

Oliver R. Johnson, Fenton Building, Jamestown, N. Y., architect, is receiving bids on a general contract until Sept. 24 for the construction of additions to the plant of the Corry-Jamestown Mfg. Co., Corry, Pa., manufacturer of metal furniture, to double the present capacity. A power plant and central steam heating plant will be erected at once. David A. Hillstrom heads the company.

Cincinnati

CINCINNATI, Sept. 15.

INCREASED production the past week of several large machine tool companies featured the local market. One manufacturer of special machines resumed full time operations; another is operating on a heavier schedule turning out machines for the Texas oil fields. Buying has been practically restricted to small machines and tools. Several good sales of used machinery were reported during the week. With the increase in production, the total volume of business in the local market for September will be ahead of that in August. The outlook is for a slow but steady increase in operations.

Railroads are doing but little purchasing at present. While several roads have lists out, they are for small machines. There has been an increase in business from the automotive industry, but it is still considerably below expectations. Electrical tool manufacturers report production on the upward grade, but sales have only been fair. Most of the business is coming from the automotive field. Some machine tool manufacturers state their sales have not been good since the first of the month and that business is quiet, but the market on the whole is better than it was a short time ago.

The Bauer Brothers Co., Springfield, Ohio, manufacturer of grinding and separating machinery, has announced that it will begin the manufacture of machinery for the making of paper pulp. Additional funds have been provided by a local syndicate which will be represented on the board of directors by P. J. Shouvlín, of the Superior Gas Engine Co., and George Cugley, of the Buckeye Incubator Co. The officers of the Bauer Brothers Co., are C. L. Bauer, president and general manager; L. E. Bauer, vice-president; and W. A. Bauer, secretary and treasurer.

The Dayton Power & Light Co., Dayton, Ohio, has begun the construction of a boiler plant to cost approximately \$35,000 and a water softener plant to cost \$30,000.

The Columbus Anvil & Forge Co., Columbus, Ohio, has been reorganized with the formation of a new company with a capital stock of \$50,000. J. E. Finneran is president and W. J. Bennett, secretary and treasurer. T. N. Long has been retained as general manager. The company's plant in Columbus will be enlarged.

The Standard Slag Co. will erect a new all-steel plant near Jackson, Ohio, to replace the works destroyed by fire July 20. The new plant will be ready for operations about the first of the year.

Contract has been let by the Board of Trustees, Miami University, Oxford, Ohio, to Boyajohn & Barr, Brunson Building, Columbus, Ohio, for a one story mechanical shop estimated to cost \$30,000. Herbert B. Briggs, Hartman Hotel Building, Columbus, is architect.

The Fischer Lime & Cement Co., 269 Walnut Street, Memphis, Tenn., has plans for the establishment of a storage and distributing plant, to include the installation of a locomotive crane, loading, conveying and other equipment. W. F. Schulz, Memphis, is consulting engineer, in charge.

The Barlow Motor Car Co., Dayton, Ohio, has acquired property at Main and Franklin Streets as a site for a new service, repair and garage building, estimated to cost \$200,000.

The Louisville & Nashville Railroad Co., Louisville, and the Atlantic Coast Line Railway, Wilmington, N. C., are reported to be considering plans for the construction of joint locomotive and car repair shops in the vicinity of Erwin, Tenn., estimated to cost \$1,000,000 with equipment. W. H. Courtenay is chief engineer for the first noted railroad, and J. E. Willoughby, chief engineer for the other railroad.

The Director of Public Service, Greenville, Ohio, will take bids until Oct. 1 for equipment for municipal power service, including electric generator, engine, motor-driven centrifugal pumps, air compressors, water softening apparatus, and accessory equipment. The J. N. Chester Engineers, Union Bank Building, Pittsburgh, are engineers. C. E. Williams is clerk.

E. W. Cooper, 174 North Third Street, Nashville, Tenn., engineer, has inquiries out for a 20-ton electric traveling crane, 40 to 50-ft. span.

The Shartle Machine Co., 369 Dublin Avenue, Columbus, Ohio, has inquiries out for a saddle tank locomotive, about 65 to 75 tons, capacity.

The Nashville Bridge Co., Nashville, Tenn., is in the market for a new or second-hand angle shear for small angles, preference to be given to a quick acting, electric driven machine.

Cleveland

CLEVELAND, Sept. 15.

THE machinery market is beginning to improve. The demand for single tools shows a slight betterment in sales and new inquiries and some business that has been pending for months show signs of being closed in the near future. Used machinery has become more active. However, while the bulk of sales has increased somewhat, business cannot yet be called fairly good. An inquiry has come from the Akron district for three 36-in. x 30 ft. lathes. Buying is well scattered, but very little is coming from automobile companies, which are confining their purchases to single tools urgently needed and are delaying proposed round lot purchases until they know more clearly how large the fall demand will be for cars.

The Nickel Plate Railroad has purchased an electric traveling crane but has not yet placed orders against its machinery list issued several weeks ago. The New York Central Railroad during the week purchased an 18-in. lathe from a Cleveland machinery house for its Gibson, Ind., shops.

The Perrott Engineering Corporation, South Bend, Ind., has been organized to manufacture four-wheel brake equipment for motor cars. It is understood that this company has purchased some die making machinery and will shortly come into the market for automatic and other production and tool room equipment.

The White Motor Co., Cleveland, will erect a \$50,000 assembling plant at Louisville, Ky., to assemble trucks for shipment to the Southern States. The Austin Co., Cleveland, has the contract.

The American Swiss Magneto Co., 1648 Fernwood Avenue, Toledo, Ohio, has taken bids for a 50 x 50 ft. foundry. Mills-Rhines-Bellman & Nordhoff, Ohio Building, are the architects.

The General Tire & Rubber Co., Akron, Ohio, has awarded a contract for enlargements that will include a four-story, 32 x 100 ft. extension to its mill room, in addition to its calender department and boiler house.

The village of Leetonia, Ohio, has completed plans for a \$70,000 sewage treatment plant. Equipment will include two centrifugal pumps with motors.

The American Sheet & Tin Plate Co. contemplates the erection of a machine shop in connection with its Canton, Ohio, plant.

The Victor Stove Co., Salem, Ohio, recently suffered a \$50,000 fire loss. This, however, will not prevent the company from continuing operations.

Detroit

DETROIT, Sept. 15.

FOUNDATIONS will soon be laid for a two-story machine shop, 80 x 84 ft., at 2615 Twelfth Street, Detroit, for the Detroit Ice Machine Co., Marquette Building, estimated to cost \$47,000 with equipment. A portion of the structure will be used for offices.

Fire, Sept. 3, destroyed a portion of the plant of the Market Furniture Co., Third and Washington Streets, Bay City, Mich., with loss estimated at \$100,000 including equipment. It is planned to rebuild.

The Three B Truck Co., Union City, Mich., recently organized, has acquired a building on South Street, formerly used as a canning factory, and will remodel for the manufacture of motor truck bodies.

The C. G. Spring & Bumper Co., Kalamazoo, Mich., manufacturer of automobile springs, bumpers, etc., is planning to concentrate production at its Detroit and Chicago plants, with bulk of operations to be carried out at the last noted works, where an addition is now in progress. As soon as this plant is finished it is purposed to abandon the present Kalamazoo works. Plans are under advisement for discontinuing manufacturing at Cleveland, where a plant leased from the Copper Spring Co., is occupied. Sales offices will be continued at Cleveland. Christian Girl is president.

The Paper Container Co., Battle Creek, Mich., has preliminary plans under way for rebuilding the portion of its plant destroyed by fire Sept. 6, with loss reported at \$90,000 including equipment.

Manual training equipment will be installed in the new junior high school to be erected at Pontiac, Mich., estimated to cost \$380,000, for which plans have been filed.

The Regent Stove Works, Inc., Wyandotte, Mich., is contemplating the early rebuilding of the portion of its plant destroyed by fire Sept. 11, with loss estimated at \$350,000.

including machinery. The enameling department sustained complete loss.

The Burton Bronze Co., Grand Rapids, Mich., recently organized, will operate a plant at 1452 Buchanan Avenue, S. W., for the manufacture of brass, bronze and other metal castings. B. T. Moore is president; George Peters, secretary; and John F. Vos, treasurer.

Atkins, Inc., Schoolcraft, Mich., has been organized to manufacture a new type of carburetor and is open to contract with manufacturers equipped to make the parts or the complete instrument. William J. Hartney is secretary.

Milwaukee

MILWAUKEE, Sept. 15.

HEALTHIER inquiry for machine-tools is coming to the attention of local manufacturers, and dealers report a little better run of business, although trade is still lacking in substantial characteristics. Evidence appears daily indicating a more favorable trend of business in foundry and machine shop industries which are broadening replacements needs. Establishment of new enterprises remains confined to small interests, with the exception of the Ajax Motors Co. at Racine, which in the coming three to six months is expected to be a heavy buyer. The Joseph Ryerson & Sons Co., Chicago, is low bidder on a gap lathe for the service shop of the Riverside pumping plant in Milwaukee.

The Appleton, Wis., Coated Paper Co. will erect a four-story paper mill addition estimated to cost \$200,000, including machinery, motors, special paper equipment, etc. The work probably will be started late in the fall. C. S. Boyd is president and general manager.

The Hartford, Wis., Tool & Machine Co., the entire interests in which recently were acquired by Fred Jordan, an original partner, has purchased a 10-ft. x 29-in. engine lathe, a large cylinder grinding machine, and is inquiring for several small tools, all motor-driven. The company has booked a number of sizable orders for machined parts from outside shops and is also engaged on several large repair jobs.

The Hub Granite Co., Marshfield, Wis., is planning to develop new granite quarries in the town of Richfield, and contemplates the construction and equipment of a cutting and polishing plant costing about \$45,000, which will require special saws and grinders, cranes and other equipment. Thomas Harshner is general manager.

The Arps Mfg. Co., New Holstein, Wis., has been incorporated with a capital stock of \$15,000 to take over and develop the business of B. F. Arps, manufacturer of automobile and tractor specialties, materials, parts and equipment. Paul and Adolph Langensfeld are associated in the enterprise. Extension of the shop and equipment is planned at an early date.

The Hexcel Radiator Co., Milwaukee, has been organized to manufacture automobile and tractor radiators. The capital consists of 500 common shares having no par value. The project is handled by Norman L. Baker and associates, attorneys, 120 Wisconsin Street, in behalf of interests whose identity for the present is withheld.

The Black River Falls, Wis., Common Council is asking bids until Sept. 29 for the general construction of a new water supply system for the municipal light and water plant. Requirements include a 300 gal. per min. centrifugal pump, connected with a 25 hp. industrial engine. A concrete dam and filtration gallery, 128 ft. long and 18 ft. 6 in. high will be constructed. W. G. Kirchhoffer, Madison, Wis., is consulting engineer. Bert Moen is waterworks superintendent.

Oscar Mayer & Co., Madison, Wis., let the general contract to J. H. Findorff & Son, local builder, for erecting a \$100,000 cold storage plant addition, five stories, 80 x 101 ft., designed by Gardner & Lindberg, consulting engineers, 140 South Dearborn Street, Chicago, who are now buying equipment, including refrigerating unit, motors, etc. A. C. Bolz is general manager.

The Plymouth, Wis., Refrigerating Co. has engaged Edward A. Juul, architect, Sheboygan, Wis., to design a 10-story addition, 54 x 60 ft., to the present cold storage warehouse, which will require additional artificial ice making machinery, an electric freight elevator, motors and other equipment. The investment will be about \$85,000. E. J. Larson is president and general manager.

The Svoboda Church Furniture Co., Algoma, Wis., will let contracts within a few days for a two-story brick and concrete addition, 50 x 125 ft., and is inquiring for miscellaneous woodworking equipment, motor-driven. A. Svoboda is president and general manager.

The Ajax Motors Co., Racine, Wis., has purchased for \$225,000 the machinery, tools and other equipment of the Lafayette Motors Corporation, Milwaukee, which has discontinued manufacture of a high-priced 8-cylinder car and is liquidating its assets. The Ajax company is preparing to manufacture a popular priced car in the former Mitchell automobile works at Racine, and opened its tool room on Sept. 15. The equipment from the Lafayette plant will be moved from Milwaukee at once, and will be supplemented by considerable new and used machinery, purchase of which awaits completion of plant layout and engineering specifications. David M. Averill is vice-president and general manager, and Earl D. Gunn is chief engineer.

St. Louis

ST. LOUIS, Sept. 15.

CONTRACT has been awarded by the Kansas City Can & Mfg. Co., 1017 North Fourth Street, Kansas City, Kan., to the P. J. Bares Co., 1938 Brighton Avenue, for the erection of a plant in the Fairfax industrial district, estimated to cost \$80,000. J. G. Braecklin, Federal Reserve Life Insurance Building, is architect.

The Pierce Petroleum Co., Sand Springs, Okla., has work under way on enlargements in its local oil refinery, to include the installation of additional equipment to develop a capacity of 10,000 bbl. per day.

H. A. Drake, Reliance Building, Kansas City, Mo., architect, has completed plans for a two-story and basement automobile service, repair and garage building, 47 x 115 ft., at 811-13 Main Street, to cost about \$70,000 with equipment. Hans Von Unwerth, Finance Building, is structural engineer.

The Pine Mountain Coal Co., Heavener, Okla., is contemplating the installation of a new plant, including electric power and mining machinery, for increase in output. The company recently increased its capital from \$65,000 to \$250,000 for expansion.

Klipstein & Rathman, Chemical Building, St. Louis, architects, have awarded contract to the Fruin & Colton Construction Co., Merchant Laclede Building, for a three-story automobile service, repair and garage building, 235 x 324 ft., to cost \$600,000 with equipment.

The Black, Sivals & Bryson Co., Bartlesville, Okla., is said to have acquired a site near Kansas City, Mo., for the construction of a new works to manufacture steel tanks and other plate products, with estimated cost of \$85,000.

The Common Council, Haviland, Kan., plans the installation of a centrifugal pumping equipment in connection with a proposed municipal waterworks and sewage system, estimated to cost \$60,000. E. T. Archer & Co., New England Bank Building, Kansas City, Mo., are engineers.

The City Water Co., Sedalia, Mo., contemplates extensions in its waterworks to cost approximately \$250,000, including the installation of centrifugal and other pumping machinery, electric power apparatus, etc.

Electric motors, controls, conveying and other machinery will be installed in the two-story printing plant to be erected at Cape Girardeau, Mo., by Neater Brothers, Inc., to be 100 x 100 ft., estimated to cost \$175,000. The T. P. Barnett Co., Arcade Building, St. Louis, is architect.

The City Water Department, Kansas City, Kan., has tentative plans for extensions in its water plant and system, to include the installation of pumping machinery, steam boilers, electric power equipment and accessory apparatus, to cost \$600,000. J. D. Donovan is chief engineer.

The J. Goldberg & Son Structural Steel Co., 800-12 East Eighteenth Street, Kansas City, Mo., is inquiring for a gate shear 5 or 6 ft., between housings, 24-in. throat and capacity for 1/4-in. plate.

Indiana

INDIANAPOLIS, Sept. 15.

THE Board of Education, Anderson, Ind., is taking bids on a general contract until Sept. 25 for an addition to one of the city schools, to be equipped for a vocational department, estimated to cost \$30,000 exclusive of equipment. E. R. Watkins, Farmers Trust Building, is architect.

The Interstate Public Service Co., Indianapolis, has tentative plans for the construction of a hydroelectric generating plant on the St. Joseph River, near Bristol, Ind., with cost placed at \$850,000. It is also projecting plans for the erection of smaller hydroelectric power stations on the Elkhart River near New Benton, Upper Benton and Faintertown.

The Jackson Township Board of Education, Antioch, Ind., is considering the installation of manual training equipment in the two-story high and grade school, estimated to cost \$110,000, for which bids will be asked at once on a general contract. Rodney Leonard, Peoples' Life Building, Frankfort, Ind., is architect.

The Apperson Brothers Automobile Co., Kokomo, Ind., has leased the local plant of the Haynes Automobile Co., now in financial difficulties, and is completing plans for a reorganization of the Haynes company. Extensions are under consideration. The Apperson company will also maintain production at its local plant for the manufacture of Apperson cars. D. C. McCord and Maurice Rothschild head the Apperson organization.

Ray Childers, Indianapolis, has leased property at 710 East Nineteenth Street, and will establish a machine shop.

In connection with an expansion program the Nordyke & Marmon Co., Indianapolis, manufacturer of the Marmon automobile, is said to be arranging a fund of \$5,500,000 for the purchase of equipment and materials. The estimated labor outlay approximates \$4,000,000. G. M. Williams is president and general manager.

The Economy License Plate Co., Macy, Ind., recently organized with cash resources of \$250,000, has started operations, but expects to be in the market soon for additional presses, dies and materials. F. J. Williams is secretary.

Pittsburgh

PITTSBURGH, Sept. 15.

MACHINE tool business in this district is picking up. The Carnegie Steel Co. has distributed orders for most of the tools for the new machine shop at its Homestead works. It is believed that the National Tube Co. is not far from placing orders for the metal working machinery for its Gary tube works. Meanwhile, current sales of individual tools are more numerous than a few weeks ago. The Westinghouse Electric & Mfg. Co. is seeking a few tools for its Homewood, Pittsburgh, plant and the Chesapeake & Ohio Railroad has issued a list of about 12 items, including four vertical turret lathes. An order for a 10-ton ore bridge for the Carrie furnaces, Carnegie Steel Co., Rankin, Pa., has gone to the Mead-Morrison Co.

Tentative plans are under consideration by the Builders Steel Works Co., 4130 Liberty Avenue, Pittsburgh, for a one-story addition at 3600 Howley Street, to cost \$21,000. Fred C. Werry is president.

The Pittsburgh Screw & Bolt Co., Preble Avenue, Pittsburgh, has filed plans for extensions and improvements to cost \$25,000. The work will include an electric transformer station.

Fire, Sept. 8, destroyed a portion of Plant No. 5 at the Eclipse oil works of the Atlantic Refining Co., Franklin, Pa., with loss estimated at \$150,000 including equipment. It is planned to rebuild.

Manual training equipment will be installed in the new four-story central high school to be erected at Johnstown, Pa., estimated to cost \$1,000,000, for which bids are being taken on a general contract until Sept. 22. J. E. Adams, Nemo Building, is architect. Edward L. Tilton, 141 East Forty-fifth Street, New York, is consulting architect.

The Board of Education, Morgantown, W. Va., plans the installation of annual training equipment at its proposed high school, estimated to cost \$600,000, for which plans are being drawn by E. B. Lee, Chamber of Commerce Building, Pittsburgh, architect.

The Connolly Motor Co., 810 Fourth Avenue, Huntington, W. Va., will soon purchase tools and equipment for its three-story service, repair and garage building, 45 x 200 ft., now in course of erection, to cost \$85,000. J. R. Gleske, First National Bank Building, is architect.

The United Electric Light Co., Wilmerding, Pa., has been granted permission by the Borough Council, Braddock, Pa., for a steam-operated electric power plant at the foot of First Street, estimated to cost \$750,000.

The J. P. Ward Foundry Co., Inc., Blossburg, Pa., has work under way on the construction of a foundry and machine shop to cost about \$50,000. J. P. Ward and J. E. Willis head the company.

The Universal Concrete Products Co., New Martinsville, W. Va., is looking for a 200 to 500-ft. crane runway of 5 to 10-ton capacity, also a 5 to 10-ton crane with 50 to 60-ft. span.

The Brick & Tile Co., Bradford, Pa., is in the market for a second-hand planer, 42 in. x 42 in., or 36 in. x 14 ft., or 16 ft., Cincinnati or Gray.

Plans are under way by the Eastman Mfg. Co., Union City, Pa., for a two-story addition, 60 x 104 ft., to cost \$50,000. Considerable woodworking, transmission, conveying and other equipment will be required.

Gulf States

BIRMINGHAM, Sept. 15.

THE Power Mfg. Co., Marion, Ohio, manufacturer of oil and gas engines, and parts, has tentative plans for the construction of a new works in the vicinity of Dallas, Tex., to include a foundry for the production of engine castings. It has recently taken out a charter under Texas laws with capital of \$600,000. B. P. Moore is Texas State manager, Dallas.

The New Orleans Public Service Co., New Orleans, will soon begin superstructure work for an addition to its steam-operated generating plant, to cost \$100,000 with equipment.

The Del Ramey Electric Co., 2428 Commerce Street, Dallas, Tex., plans for the installation of additional equipment, including a lathe, grinding machine and other tools.

The Vacuum Oil Co., 61 Broadway, New York, affiliated with the Standard Oil Co., has purchased about 400 acres in the Panhandle oil fields, near Amarillo, Tex., and is reported to be planning to use a portion of the site for the construction of a new oil refinery.

The Tuscaloosa Lumber Co., Fourteenth Avenue and Fifteenth Street, Tuscaloosa, Ala., will install bandsaws, resaws, planers, trimmers and other woodworking machinery in connection with rebuilding the portion of its mill recently destroyed by fire with loss of about \$50,000, on which work will proceed immediately.

The Southern Oil & Refining Co., Houston, Tex., recently organized, has acquired the gasoline refinery of the Associated Refining Co. at Oil City, La., and will place the plant in service at an early date. It has also purchased the Oil City grease and asphalt plant heretofore owned by the Union Oil & Pipe Line Co., and following improvements will resume production. Negotiations are in progress for the purchase of a refinery at El Dorado, Ark., which will be enlarged and additional topping and other machinery installed. The company is said to have preliminary plans for a new refinery on the ship channel at Houston, Tex., to be equipped for an output of 3000 bbl. per day; a portion of the works will be given over to lubricating oil manufacture. W. G. Banks, Shreveport, La., is president of the new company, and L. H. Grey, El Dorado, secretary.

The Common Council, Ormond, Fla., plans the installation of centrifugal pumping machinery at its proposed municipal waterworks, estimated to cost \$100,000, for which bonds will soon be arranged.

The Board of Trustees, Carroll College, McAllen, Tex., is having plans drawn for a new power house estimated to cost \$45,000. H. P. Smith, National Bank of Commerce Building, San Antonio, Tex., is engineer.

Talley & Talley, Lakeland, Fla., architects, have plans for a two-story automobile service, repair and garage building, 95 x 100 ft., at Bartow, Fla., estimated to cost \$60,000. Equipment bids will be asked early in the coming year.

The Big Lake Oil Co., a subsidiary of the Benedum Trees Oil Co., Benedum Trees Building, Pittsburgh, Pa., has plans under way for a gasoline refinery at Texon, near San Angelo, Tex., estimated to cost \$250,000 with equipment. It is also proposed to build an ice-manufacturing plant on adjoining site. Levi Smith, formerly connected with the Transcontinental Oil Co., another subsidiary of the same parent company, is president of the Big Lake company, and Frank T. Pickrell, vice-president.

The Dunbar Rim Tool Co. has been organized at Elgin, Tex., to manufacture automobile rim tools and accessories. The principals are W. H. Rivers, Jr., J. V. Dunbar and A. M. Felts. It has arranged for all manufacturing for the present, but will later be in the market for some equipment.

Pacific Coast

SAN FRANCISCO, Sept. 10.

NEGOTIATIONS are under way by the White Portland Cement Co., Los Angeles, recently organized with a capital of \$3,000,000, for the purchase of about 15 acres at East Los Angeles as a site for a new mill, with power house and machine shop to cost \$650,000 including machinery. The company has secured 1800 acres of raw material property at Saugus Cal., and will install equipment for production. L. V. Bentley is president of the company which is represented by Lewis Cruickshank, Los Angeles Trust and Savings Building, attorney.

The Pacific Coast Steel Co. 1005 Bartlett Building, Los Angeles, has acquired property, 300 x 400 ft., on Stanford Avenue, and plans the early erection of a one-story storage and distributing works, 80 x 200 ft. A second unit of like size will be constructed later. Material handling and conveying machinery will be installed.

A. B. Gardner, Stayton, Ore., operating a local hydroelectric power plant on the Santiam River, has plans under

way for enlargements, with the installation of additional equipment to increase the output to 10,000 hp.

Schafer Brothers Montezano, Wash., have plans under consideration for rebuilding their lumber mill destroyed by fire Sept. 1 with loss estimated at \$750,000 including machinery.

Ovens, power equipment, conveying machinery, refrigerating apparatus and other equipment will be installed in the one-story baking plant, 160 x 250 ft., to be built at Oakland, Cal., by the Ward Baking Co., Los Angeles, to cost \$120,000. J. M. Cooper, Marsh-Strong Building, Los Angeles, is architect.

The Northwestern Power & Light Co., Port Angeles, Wash., is disposing of a bond issue of \$800,000, a portion of the proceeds to be used for expansion and improvements. M. R. Higgins is president.

The North Portland Woodenware & Cooperage Co., North Portland, Ore., has tentative plans for rebuilding the portion of its mill and power house destroyed by fire Sept. 1 with loss estimated at \$100,000 including equipment.

The Beverly Hills Ice & Cold Storage Co., Beverly Hills, Los Angeles, recently organized, is planning the construction of a one-story ice-manufacturing and cold storage plant estimated to cost \$100,000 with equipment. The company is headed by H. H. Thresher, Jr., and J. W. Fagin. It is represented by H. Clyde Harms, attorney, Merritt Building, Los Angeles.

South Atlantic States

BALTIMORE, Sept. 15.

BIDS will be received by the General Supply Committee, Washington, until Sept. 22 for a quantity of tools, files, drills, stocks and dies, grinding wheels, hammers, wire, iron, steel, lead, zinc, babbitt metal, copper, etc., for executive departments of the Government, Class 2, also for a quantity of electrical equipment, 74,000 fire brick, brass pipe fittings, compression flanges, lead pipe, welded steel pipe, brass pipe, valves, compression washers, etc., Class 6.

The Hearn Oil Co., Wilmington, Del., has taken over the former plant of the Bethlehem Steel Co., Third and Commerce Streets, for the establishment of new works. The structure will be remodeled for a storage and distributing plant, with increase in present power house from 170 to 1000 hp. A laboratory for lubricating oils will also be installed. The work will cost about \$75,000. C. P. Hearn is president, and G. B. Hearn, secretary and treasurer.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Sept. 30 for bolts, nuts and rivets for the Mare Island and Puget Sound navy yards, schedule 2655; for 12,300 ft. wire rope for Eastern and Western yards, schedule 2656; until Sept. 23 for a quantity of brass, bronze and copper for Eastern and Western yards, schedule 2626; and for a quantity of brass, copper, iron and steel wire for Eastern and Western yards, schedule 2631.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for one oil engine, 200 to 300 hp. capacity, with accessory equipment; also one 16 in. x 6 ft. swing lathe; one turret lathe; 2-yd. capacity drag line bucket; motor-generator sets, 75 to 80 kw. capacity each, three-phase, 60 cycle, complete with starting equipment; one centrifugal fire pump, about 1000 gal. per min. capacity; number of motors, 25 to 150 hp. capacity, three-phase, 60-cycle, 550 volts, complete with starting equipment, base and pulleys; motors, 3 to 15 hp. capacity, three-phase, 60-cycle, 220 volts; 50 kva. transformer, 13200/2300 volts, single phase, 60-cycle; and one exciter suitable for 125 kw. generator, three-phase, 60-cycle, 220 volts, belt type.

The Magneto & Machine Co., 1031 Cathedral Street, Baltimore, has acquired property adjoining its plant for \$10,000 for proposed expansion.

The American Fruit Growers' Express Co., Florence, S. C., has awarded contract to the Ball Ice Machine Co., 3003 North Broadway, St. Louis, for an ice-manufacturing, ice storage and car-icing plant on local 4-acre tract, to cost \$400,000, with equipment.

The Royal Silver Mfg. Co., Twenty-second Street, Norfolk, Va., manufacturer of plated ware, metal specialties, etc., plans the construction of a one-story addition to cost approximately \$25,000 with equipment.

D. C. Elphinstone, 408 Continental Building, Baltimore, machinery dealer, has inquiries out for a steam or gasoline-operated locomotive, about 15 tons capacity, 30-in. gage.

Fire, Sept. 4, destroyed the plant of the James B. Ayers Farm Implement Co., Petersburg, Va., with loss estimated at \$75,000 including equipment. The works of the Atkinson & Long Mfg. Co., manufacturer of locks and other hardware products, in the same building, were also partially destroyed. It is planned to rebuild both plants.

The Gray Lumber Co., Waverly, Va., is in the market for a Mogul type locomotive, 40-ton capacity, 36-in. gage.

The Maryland Cork Co., Baltimore, recently organized, has leased a two-story plant in the Towson section for the establishment of a plant to manufacture gaskets and other cork products. In the near future it is purposed to build new works to cost \$200,000 with machinery.

The Twin City Furniture Mfg. Co., Bristol, Va., has tentative plans for the construction of a two-story factory, 100 x 250 ft., to cost \$100,000 including machinery. The company was formed recently with a capital of \$250,000. J. F. Crowder is secretary and treasurer.

E. E. Lindsey, Rome, Ga., local representative for the Marmon and Studebaker automobiles, is having plans drawn for a two-story service, repair and garage building, 60 x 120 ft. C. E. Frazier, Atlanta, Ga., is architect.

Work has been started by Samuel Kirk & Sons, 106 East Baltimore Street, Baltimore, on a one-story factory, 100 x 130 ft., at Taylor Avenue and Twenty-fifth Street, for the manufacture of silverware. Harry C. Kirk, Jr., is president.

The Board of Estimates, Baltimore, has appropriated \$65,000 for the construction of a repair shop for the Baltimore Fire Department. It will be built at Key Highway and Webster Street and will replace the present shop at Fallsway and Market Place.

Canada

TORONTO, Sept. 15.

IMPROVED demand features the machine tool market. For the month of August builders and dealers report an increase of 10 per cent in sales over those of July, while so far this month there has been an advance of about 10 per cent over those of August. The general outlook is optimistic and prospects are good for a continuous demand for many lines of equipment. While the majority of sales are for one or two tools, a few fair-sized lists have been booked the past week or two and inquiries are before the trade for other lists.

W. W. Hilts, mayor, chairman of the Board of Control, Toronto, will receive bids until Nov. 11 for one 10,000,000 Imperial gal. steam turbine-driven centrifugal pump.

It is reported that ground will be broken about Oct. 1 for a new plant for the St. Regis Pulp & Paper Co., at Cap Rouge, Que. Three buildings will be erected for the production of pulp and a fourth for the manufacture of cardboard. The ultimate expenditure will be between \$3,000,000 and \$4,000,000.

Plans are being prepared by T. Pringle & Son, 20 St. Nicholas Street, Montreal, for addition to the plant of the Sherwin-Williams Co., Ltd., estimated to cost \$75,000.

The Grinnell Co. of Canada, Ltd., Beaumont Avenue, Montreal, manufacturer of sprinklers, compressors, etc., will build a galvanizing plant and has awarded a general contract to Anglin-Norcross, Ltd., Montreal.

The Hirst Mfg. Co. is contemplating establishing a manufacturing plant at Preston, Ont., for the manufacture of knife sharpeners, paring knives, automatic can openers, etc. Percival W. Hirst is president of the company.

The Dominion Sugar Co., Tecumseh Road, Chatham, Ont., is planning for the erection of an addition to its works to cost \$100,000.

The Auto Specialties Mfg. Co., Windsor, Ont., is building an addition to its factory to cost \$15,000. Machinery and tools will be purchased.

It is reported that the Continental Wood Products, Ltd., a subsidiary of the Continental Paper Bag Corporation, New York, will build a paper mill on the Canadian National Railway line near Foley, Ont. L. E. Bliss is vice-president and general manager.

Fire of unknown origin completely gutted the woodworking factory on Curtis Street, St. Thomas, Ont., owned by Charles Heard. It is expected that the owner will rebuild.

Negotiations have been completed by which John Lysaght, Ltd., of Bristol and Newport, a large producer of sheet metal in Great Britain, acquired a substantial interest in the Dominion Sheet Metal Corporation, Hamilton, Ont. A. T. Enlow, head of the Canadian company, will continue as president and managing director. The merger, it is stated, will result in increased production at the Hamilton works and it is possible that the plant will be considerably enlarged in the near future. W. H. D. Gladstone of the Bristol plant of John Lysaght, Ltd., represented the British firm in the negotiations.

The Peck Rolling Mills, Ltd., Montreal, is in the market for an angle straightener, capacity up to 6-in. angles.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates	
Bars:	Per Lb.
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	6.75c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel	
Tire, 1½ x ½ in. and larger	3.25c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.50c.
Toe-calk, ½ x ¾ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.15c.
Square, flats and hex.	4.65c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	80c.

Sheets	
Blue Annealed	
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black	
Soft Steel	Blued Stove
C. R., One Pass	Pipe Sheet
Per Lb.	Per Lb.
Nos. 18 to 20	4.30c. to 4.45c.
Nos. 22 and 24	4.45c. to 4.60c.
No. 26	4.50c. to 4.65c.
No. 28*	4.60c. to 4.75c.
No. 30	4.70c. to 4.95c.

Galvanized	
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Standard Steel	
Black	Galv.
½ in. Butt...	—41 —24
¾ in. Butt...	—46 —32
1-3 in. Butt...	—48 —34
2½-6 in. Lap...	—44 —30
7-8 in. Lap...	—41 —11
9-12 in. Lap...	—34 —6

Welded Pipe	
Black	Galv.
½ in. Butt...	—4 —19
¾ in. Butt...	—11 +9
1-1½ in. Butt...	—14 +6
2 in. Lap...	—5 +14
2½-6 in. Lap...	—9 +9
7-12 in. Lap...	—3 +16

Bolts and Screws	
Machine bolts, cut thread,	50 to 60 and 10 per cent off list
Carriage bolts, cut thread,	40 to 40, 10 and 10 per cent off list
Coach screws, 50 and 10 to 65 per cent off list	
Wood screws, flat head iron,	75, 20 and 10 per cent off list

Steel Wire	
Base Price*	On No. 9 Gage and Coarser
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Pinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

Base Price	
High brass sheet	17¼c. to 18¼c.
High brass wire	17¼c. to 18¼c.
Brass rods	15 c. to 16 c.
Brass tube, brazed	25¼c. to 26¼c.
Brass tube, seamless	21¼c. to 22¼c.
Copper tube, seamless	22¼c. to 23¼c.

Copper Sheets	
Sheet copper, hot rolled, 20% c. to 21% c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates	
Bright Tin	Coke—14 x 20
Grade "AAA"	Grade "A"
Charcoal	Charcoal
14x20	14x20
IC.. \$11.25	\$8.85
IX.. 12.85	10.85
IXX.. 14.40	12.55
IXXX.. 15.75	13.85
IXXXX.. 17.00	15.05

Terne Plates	
8 lb. coating, 14 x 20	
100 lb.	\$7.00 to \$8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin	
Straits, pig	56c.
Bar	60c. to 65c.

Copper	
Lake ingot	16 c.
Electrolytic	15½c.
Casting	14¼c.

Spelter and Sheet Zinc	
Western Spelter	7¼c.
Sheet zinc, No. 9 base, casks	10.85c. open 11.60c.

Lead and Solder*	
American pig lead	9¼c. to 9¾c.
Bar lead	11c. to 12c.
Solder, ½ and ½ guaranteed	39 c.
No. 1 solder	36 c.
Refined solder	30¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony	
Asiatic	13c. to 14c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals
Business is quiet and values show little change. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.50
Copper, heavy wire	11.00
Copper, light bottoms	9.00
Brass, heavy	6.50
Brass, light	5.50
Heavy machine composition	8.50
No. 1 yellow brass turnings	7.25
No. 1 red brass or composition turnings	7.75
Lead, heavy	7.00
Lead, tea	5.25
Zinc	3.75
Cast aluminum	15.50
Sheet aluminum	15.50